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"PACIFIC VIEWPOINT"

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Pacific Viewpoint

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THE ASIAN AND PACIFIC SCENE

GEOGRAPHICAL REVIEWS

Foreword

ON behalf of the University I have much pleasure in welcoming this Journal, and congratulating the staff of the Geography Department, whose planning and efforts have made possible the launching of the venture, on their enterprise and the excellence of the production.

The Journal is a recognition that New Zealand's destiny is that of a Pacific country and that, although our cultural heritage is derived from Europe and in particular the United Kingdom, many of our neighbours differ from us both in culture and in race. There is an increasing awareness in New Zealand that the members of the Pacific group of nations must learn to live as a community knit together by friendship based on an understanding of each other's interests and problems. Knowledge is the key to this situation and we in New Zealand have in the past been sadly lacking in such knowledge.

In this University there have for many years been those who have striven to bring about a change in our condition of ignorance, and we have taken some positive steps to this end. I would mention our pioneering action in establishing a Department of Asian Studies, whose particular interest is in our Asian neighbours. In the Geography Department there has long been a strong emphasis on the Pacific viewpoint, and our economists, educationists, historians, lawyers, psychologists and zoologists have likewise directed the attention of their students to the Pacific. Members of our staff, both present and past, have played and are playing an important part in the deliberations and planning which are transforming the constitutional and economic status of New Zealand's Pacific dependencies and leading those dependencies to a condition of adult nationhood. We have given a warm welcome to proposals (unhappily not yet carried into effect) for the provision of special training for those who have the responsibility of administration in New Zealand's Pacific territories.

Although this Journal is produced by the Geography Department of the University, its editorial staff hope that it will constitute a forum in which Pacific specialists in the social and natural sciences both within the universities of New Zealand and outside of those universities will find an opportunity to contribute to widening our understanding of our Pacific world. I would particularly thank those from outside the University who have contributed to this inaugural number.

I hope that this Journal has the success which the aims and labours of its promoters deserve, and that it will encourage an informed interest in the great geographical area which is the stage on which New Zealand's destiny will be worked out.

J. WILLIAMS
Vice-Chancellor

February 1960

Introducing Pacific Viewpoint

In initiating the publication of *Pacific Viewpoint* we have been prompted by two considerations: firstly, the increasing world importance of the Asian and Pacific countries; secondly, the need for a journal which, while basically geographical in its emphasis, would be able to present the work of scholars in the social and natural sciences who are also concerned with this regional field.

The growing importance of the Asian-Pacific world needs little stressing. It is linked with the great expansion of Asia's population which is taking place and with the technological transformation of the old societies of Asia. These demographic and technological revolutions are shifting the centre of world power from the Atlantic towards the Pacific basin. The two giants of our time—the U.S.A. and the U.S.S.R. —are both Pacific powers; so, too, is China, the emerging giant. The political emergence of new Asian states and their growing role in the United Nations underlines this revolution. The increasing output of books on the social, political and economic development of Asia indicates an awareness of these developments and of their implications for the West. The pace of change is so rapid, however, that most texts are outdated by the time they appear. There is thus an urgent need for periodicals which will provide an up-to-the-minute assessment of recent developments. While several long-established journals are available to those wishing to publish analyses of political or economic changes, there is no periodical dealing exclusively or mainly with the changing geography of the Asian-Pacific world. *Pacific Viewpoint* is intended to fill this gap.

A balanced understanding of the new world that is emerging is dependent on the work of scholars in many disciplines. Areal studies, focused on a distinctive region, no less than inter-disciplinary studies of specific problems, provide such a balanced understanding and have helped to break down the rigid boundaries between subjects. Moreover, each subject gains from progress in related disciplines; our knowledge of the geography of the Pacific world has, for example, been greatly widened by the work of sociologists and anthropologists, of archeologists and historians. The second objective of this journal is to make possible the publication of such studies, made from widely differing viewpoints, yet focused on the Pacific area. In so doing, the journal will retain its geographical character, but our hope is that each issue may contain contributions by workers in related fields. In this first issue we have been fortunate in drawing on contributions from agronomists, historians, sociologists and economists. It is hoped that workers in these and related fields may contribute to future issues. And we may stress that, just as it is important, if the journal is to fulfil its purpose, to

draw on contributors from many fields, so, too, it is important to present a diversity of viewpoints. The interpretation of a rapidly changing Asian scene lends itself to such a diversity; only by welcoming this can a real independence of outlook be attained.

The present issue contains papers on some of the major themes which give a unity to our Asian-Pacific world. It is a dominantly peasant world, whose life rests on a variety of agricultural systems, ranging from the *sawah* cultivation of Java to the shifting agriculture of upland Korea. There is a fundamental contrast between those systems characterised by permanent cultivation, whether of dry or irrigated crops, and those based on shifting cultivation. These latter have become "marginal economies" and in much of upland Asia and the Pacific are showing signs of breakdown. In his paper, R. F. Watters examines this shifting cultivation; he illustrates how oversimplified many of the current descriptions of it are and how delicate are the balances established by various groups with an exacting environment. He shows that shifting cultivation represents an "ecological climax" beyond which little evolution could occur until the whole ecosystem was disturbed. The impact of the West, in Asia no less than in Africa or Latin America, has destroyed the old balance. Attempts to recreate the old pattern are useless; the problem facing these marginal economies is "to establish a new relationship that does not violate the 'design of nature' and yet is consistent with the needs of a twentieth century world" (p. 95).

This peasant world was by no means entirely isolated; the introduction and diffusion of new crops altered the rhythm of rural life and made possible the expansion of both cultivated area and population (p. 11). Jacques Barrau's study of plant introduction in the Islands illustrates the importance of the contribution made by such borrowings from the outside world. These introduced plants helped to make life possible on the most destitute islands of the Tropical Pacific. They provided man with a "biological auxiliary" which enabled him to extend his living space out from Southeast Asia into the island-dotted world of the Central and South Pacific, a process which sometimes involved the skilful creation of an artificial environment suited to the specialised needs of his introduced food crops (p. 3). And, when the Island populations were drawn into production for a cash market, plants introduced during the period of European contact were to play a major role in the development of dangerously specialised export economies.

Most of these Asian and Pacific countries were formerly colonial or semi-colonial territories; in this legacy and in the problems they face in reshaping their political structure lies another common theme. All face the problem of cultural pluralism, since they have to integrate in one social and political framework both advanced lowland societies and backward hill peoples and groups who are indigenous and others resulting from more recent immigration. T. G. McGee's paper discusses

these aspects in a Southeast Asian context; he analyses the diversity-in-unity which results from the history of the various countries, from the character of the former colonial regimes and the conditions under which independence was attained. An awareness of these diversities is important to an understanding of the contemporary scene: concepts such as "democracy" or "socialism" have a different content in Southeast Asia from in Western Europe and there are also significant contrasts in their interpretation between one Southeast Asian country and another.

The attainment of political independence has been followed in each country by attempts to diversify the economy by industrialisation. The elimination of poverty and of economic backwardness is as important as the elimination of colonial control if these emergent countries are to attain real equality with the developed countries of the West. The problems of economic development faced are, however, very different from those faced by the older industrial countries. In Asia the major resource is represented by the great concentrations of population and economic advance must initially depend on a programme which converts this labour into capital. The development schemes of India and China, though based on contrasting political and social philosophies, are major steps in this direction. Keith Buchanan examines some of the changes in the rural landscape of China brought about by the boldly-conceived development plans of the Chinese Peoples' Government. While a final judgment on the Chinese achievement is scarcely possible, two points emerge very clearly: firstly, the close relationship between institutional change and economic development; secondly, the fact that Communist planners, by insisting on the simultaneous development of large-scale modern industry and small-scale "native-type" industry, are creating a new and distinctive type of society in their rural areas. Both of these points are of obvious significance to the other underdeveloped nations of Asia, and of Africa and Latin America, who face rather similar problems.

Many of the topics discussed are controversial and the views expressed are those of the authors concerned. The Editorial Board hopes that the diversity of views expressed, and the controversial quality of some, will provide a stimulus to all those concerned with an understanding of the changes that are transforming the Asian and Pacific scene.

THE EDITOR

Plant Introduction In The Tropical Pacific

Its Role in Economic Development

JACQUES BARRAU

THE changes which have taken place in the social and economic life of the tropical Pacific islands since their discovery by the Europeans have been the subject of many studies. One of the factors of these changes which deserves to be better known is plant introduction. The economic flora of these islands has been enriched both by the foreigners who have visited them or have settled there since the sixteenth century, and by ancient migrations. As the economy of the tropical Pacific territories was, and still is, largely based on agriculture, many of the useful plants thus introduced have been responsible for appreciable modifications in the life of the islanders.

IN ANCIENT TIMES

In the pre-European era, the tropical Pacific islands knew only a subsistence economy, based, in some cases, on food-gathering, but more generally on bush-fallowing horticulture. The sustenance crops included mostly tubers such as yams (*Dioscorea* spp.), and various aroids of which the most important was taro (*Colocasia esculenta*). Fruits like those of the banana (*Musa* spp.), the coconut palm (*Cocos nucifera*), and the breadfruit tree (*Artocarpus altilis*), were also among the staple foods. The main agricultural implement was the digging-stick.

There is no need here to describe at length the traditional subsistence horticulture and food plants of Oceania about which additional information can be found elsewhere.[1]

It is important to note that perhaps nowhere else in the tropical world have starchy tubers played such an important role in native subsistence economy. Cereals were apparently unknown, except in one territory, Guam, in Micronesia, where rice seems to have been grown in pre-European days.

Many of the cultivated food-plants of pre-European Oceania were brought to the islands by the migrants who populated them. The greater proportion of these plants came, most probably, from the areas included

Jacques Barrau, formerly plant introduction officer of the South Pacific Commission, Noumea, New Caledonia, is now executive officer for economic development.

[1] Barrau (1957) and (1958) and Barrau (in press).
[2] Vavilov (1949–50).

by Vavilov[2] in what he called the "Indian and Indo-Malayan centers of origin of cultivated plants".

The writer has suggested elsewhere[3] that the geographical definition of the second of these centres—the Indo-Malayan one—was perhaps too narrow, and that it could be modified eastwards so as to include Western Melanesia, especially New Guinea and adjacent islands. This part of Oceania could have been the centre of origin of food plants such as the sago palm (*Metroxylon* spp.), the *Jehi* banana (*Musa troglodytarum*), and, perhaps, the sugar cane (*Saccharum officinarum*).

It is certain that economic plant introduction started in Oceania with the ancient human migrations. However, there are instances in early times where local plants were probably used as a source of food through gathering. Such was the case, for instance, of ferns possessing edible rhizomes or containing starch in their stipes (*Cyathea, Marattia, Nephrolepis, pteridium* spp.) of *Cycas,* of which the ovules were eaten, of seeds of some *Agathis* pines, and of *Pandanus.*

The food resources offered by the native flora of Oceania were nevertheless very limited and the staple food plants grown in the islands, when the Europeans discovered them, were, for the most part, introduced species. A good, but rather controversial, example of such introduction is the sweet potato (*Ipomoea batatas*), which seems to be an exception to what has already been stated about the Indian and Indo-Malayan origin of many Oceanian subsistence crops.

Since the polemics which followed Heyerdahl's memorable crossing of the Eastern Pacific on the "Kontiki" raft,[4] it is commonly held that the possible centre of origin of the sweet potato is in Central and South America and it could have been introduced from there into Polynesia by ancient voyagers. Some botanists, however, do not agree with this opinion and a good example of the rather fierce controversies on this subject can be found in the last book of the late Professor Merrill.[5] This sweet potato is also grown in the central highlands of New Guinea where it is the staple food and where it was already being grown before the Europeans visited these areas. One possible explanation is that it was brought into New Guinea from nearby eastern Indonesia, around the sixteenth century, after the Portuguese had introduced it there from America. The rather hostile ecological conditions prevailing in the main part of the New Guinea highlands (cool and rainy) made special horticultural methods necessary to grow the sweet potato on waterlogged ground. The result was the extraordinary gardening system with drainage which is a characteristic of many a highland valley of New Guinea, such as in the Baliem area or in the vicinity of the Wissell Lakes.

[3] Barrau (1957).
[4] Heyerdahl (1952).
[5] Merrill (1954).

In some areas, it seems that certain new agricultural techniques were also introduced by migrants. Thus, in New Caledonia, old legends tell the story of newcomers who arrived in the island "once-upon-a-time" and taught the inhabitants how to grow taro (*Colocasia esculenta*) on irrigated terraces.

Moreover, inter-island voyages resulted in a considerable exchange of plant material. In Uvea Island, one of the Loyalty group, off the east coast of New Caledonia, can be found a cultivar of an edible aroid (*Alocasia macrorrhiza*), a type of coconut palm with very large nuts, and some varieties of breadfruit which appear to have been introduced into this part of Melanesia by Polynesians from Wallis Island. They arrived and settled in the Loyalty group probably around the sixteenth century and the above-mentioned plants still bear their Wallisian vernacular names in Uvea.

Through plant introduction by ancient migrants, human life became possible on the most destitute islands of the Tropical Pacific—the atolls. These low coral islets have not much to offer in the way of natural vegetable food resources. Almost all of the few sustenance crops traditionally grown there were introduced by the migrations. In some cases, the introduced plants needed to be acclimatised to the peculiar conditions of the atolls. The soil is coral sand, and fresh water is only present as a lens in hydrostatic balance on the brackish ground-water. Needless to say this is not a very suitable environment for gardening. In spite of this adverse situation, *Cyrtosperma chamissonis,* an aroid with edible tuber, to give only one example, was, and still is, grown on the Micronesian atolls. The species seems to have its origin in the swamps and tropical rain forests of the Indo-Malayan area. To grow it on the atolls in the Gilbert Islands, for instance, the Micronesians have developed specialised techniques. Pits are dug in the central part of the islets until the level of the relatively fresh ground-water is reached. On the mud, the *Cyrtosperma* grows in baskets filled with compost and thus finds an artificial environment rather similar to its natural one.

The above description is intended to provide a general idea of the pre-European agriculture and economic flora of Oceania. We are, however, far from having a complete history of agriculture in the old days of the tropical Pacific islands; in New Guinea, for instance, stone mortars and pestles, often large-sized, are common archaeological finds yet the Papuans do not seem to have any tradition concerning the past use of these implements. They are so commonly found that one might surmise that they were in daily use, perhaps for food processing. If such was the case, this raises the question of what type of food was crushed or hulled in such a manner. Perhaps the cereal used was one such as "Job's tear" (*Coix lacryma jobi*), a common weed in New Guinea as in many other Pacific islands. Today in Oceania, however, the fruits of this plant are only used for ornamental purposes, such as

necklaces, although the hill peoples of the Philippines and India still use the "Job's tear" as a food plant. The purpose of these mortars is a fascinating problem; its solution must await methodical archaeological research taking place in New Guinea.

The pre-European economy of Oceania—a strictly subsistence one—was thus largely based on introduced plants. On an average, in the traditional diet of the Pacific islanders, more than eighty-five per cent of the quantity of food consumed was of vegetable origin. In most cases this came from foreign sustenance crops introduced into Oceania by the ancient migrations.

THE EUROPEAN ERA IN PLANT INTRODUCTION

With the early European voyages of discovery and exploration in the tropical Pacific, a new era in plant introduction began.

When, at the end of the sixteenth century, Alvaro de Mendana and Pedro Fernandez de Quiros discovered the Marquesas Islands and tried to establish a settlement there, one of their first actions was to sow maize (*Zea mays*).

During the seventeenth century a number of food plants was introduced into Guam by the Spaniards, whose galleons then sailed across the Pacific from Mexico to the Philippines and back via Guam. In 1676, maize was already well-established there as a sustenance crop and "tortillas", the Mexican pancakes made from ground maize, soon became a common feature of Guamanian meals. This cereal was not the only useful species brought to Guam by the Spaniards. They also imported the sweet potato (*Ipomoea batatas*), which in Guam still bears its old Mexican name, *Camote,* as do many other useful plants introduced in the same way, such as the yam bean or *Hikamas* (*Pachyrrhizus erosus*), the spinach-like *Amaranthus* known as *Kiletes,* and the peanut (*Arachis hypogaea*) known to Guamanians as *Kakahuate.*

The story of maize in Guam is an example of a rather important change in subsistence economy. Before the Spanish days, yams, taro and other aroids, breadfruit trees and bananas were the staple food plants while rice was also grown. These plants lost some of their importance as they were gradually superseded by the introduced maize. It became so much in demand that two crops were regularly attempted during the year: the first one, sown after the April rains, was harvested in September and called *las primeras;* and the second one, sown between September and November, was called *los adventureros* and, as the Spanish name implies, was rather a gamble.[6]

In the generously-minded eighteenth century, at the time of the British and French voyages of exploration in the Pacific, a number of

[6] Safford (1910).

plants were imported with the specific purpose of enriching the economic flora of the islands visited, and improving the food resources of the islanders. This was sometimes done with more beneficence than technical knowledge. Thus Bougainville, visiting Tahiti in 1767, decided to show the natives how to make a garden in the French way and sowed it in wheat, barley and oats. . . . Cook and the illfated La Pérouse had a sounder approach to the problem and climatological analogues were taken into consideration when selecting the plants they wanted to introduce into the Pacific islands. Thus came to Polynesia, on board Cook's ships, *Citrus,* pineapple, perhaps peanuts, again maize and also some tropical green vegetables, among them probably the Calalou (*Xanthosoma brasiliense*) from the Caribbean Islands.

During the nineteenth century, missionaries, traders and sailors furthered these plant introduction activities. As far as Polynesia is concerned, the writer has elsewhere given[7] some details about the history of plant introduction by the Europeans in this part of Oceania. To quote only the example of Tahiti, the following is a list of some useful plants introduced there in the nineteenth century: cassava (*Manihot utilissima*) in 1850, cashew-nut (*Anacardium occidentale*) in 1875, mango (*Mangifera indica*) in 1848, Arabian coffee (*Coffea arabica*) in 1817, vanilla (*Vanilla* spp.) in 1848, cocoa tree (*Theobroma cacao*) in 1880.

During this century, the improvement of inter-island communications facilitated the exchange of plant material. Thus a native of the Loyalty Islands, a teacher of the London Missionary Society, was sent to Papua; on returning to his island, he took back a number of plants, including a Papuan cultivar of the yam, *Dioscorea alata.* It is today commonly grown everywhere in the New Caledonian archipelago and is known to the natives by the simple name of *Papua.*

Even "black-birding" played its part in plant introduction: the Melanesians who returned to the New Hebrides after their forced sojourn on the Australian plantations found means of taking back various plants. In this archipelago vernacular names of varieties of sugar cane and of bananas are simply deformations of "Brisbane" or of other place-names in Queensland whence they originated.

In the meantime, commercially-minded Europeans began to survey the resources of the islands' economic flora to find what could be exported. The first venture was the well-known sandalwood (*Santalum* spp.) trade which began around 1815 in Melanesia.

Arrowroot, processed from the tubers of *Tacca leontopetaloides,* citrus fruits gathered from the groves of almost wild trees which were the progeny of Cook's introduction, and molasses from sugar cane, were also among the first sources of cash for the Polynesians, while

[7] Barrau (1959).

at one time yam tubers were exported from Fiji. These are only a few examples of early sales of crops.

Coconut oil was processed in many islands for export. In New Caledonia, around 1855, some European traders built primitive oil factories which are worth describing. In these factories copra was grated and placed in native canoe hulls as containers. These hulls were left in the open on coral sand beaches. The sun's action, plus some fermentation, was sufficient to free the oil, which was then collected, barrelled and exported. What remained of the grated copra was used as pig-feed. The above-described process was nothing more than the traditional Polynesian process. Needless to say, the oil thus produced was not very clean and it soon became obvious that sun-dried copra was a far better produce for export, and it therefore gradually superseded coconut oil for this purpose, as from 1870. Elsewhere, as in Samoa, oil was produced in the same way by the natives themselves, who sold it to the German traders. In the meantime, some of the European-introduced plants were already in cultivation, as in the case of Arabian coffee in New Caledonia.

By the end of the nineteenth century, European traders and planters were already firmly established in all the islands, and a wide range of economic plants had been introduced from other tropical areas.

FROM EUROPEAN PLANTATION AGRICULTURE TO ISLANDERS' CASH-CROPPING

The result in general of Western impact has been to disrupt the closed economies of Island life and to expose the natives to the influences and requirements of European markets. With the acceptance of Western values, new wants were created. The expansion of trade for sandalwood, coconut oil, copra, and other products furthered this process of increasing cash-consciousness among Pacific Island peoples.

This process was accelerated by numerous European ventures in the latter part of the nineteenth century. Coconut plantations were established, whereas previously nuts were gathered from existing groves for the purpose of oil or copra making. On many "high islands" European planters began export production of introduced crops such as coffee, cocoa, and various rubber-yielding trees. Sugar cane was grown commercially in some territories; an example is New Caledonia where four rum factories were in operation about 1870. Rice growing was also undertaken, while several attempts were made to develop cotton as a cash crop.

Amongst these attempts, one in the Fiji islands is worth mentioning. In 1860 the British government decided to investigate the agricultural possibilities of this group and sent a botanist, Berthold Seeman, there for this purpose. It was indeed a successful mission, for it resulted in

the publication of the outstanding *Flora Vitiensis* and also in an enthusiastic report on the suitability of the islands for cotton growing. So optimistic was Seeman and so high his opinion of Fiji for this purpose, that Britain decided to annex the group. In those far-off days, governments took notice of what botanists had to say!

In the beginning, the Europeans, with a few exceptions, had not a very high opinion of the Pacific Islanders as farmers. Their traditional system of bush-fallow subsistence horticulture was regarded as wasteful of land and as being of no economic value. Certainly it was ill-adapted to the needs of European commercial agriculture and under these conditions a policy of developing European settlements and plantations emerged. The settlement of New Caledonia is a result of such a policy.

It has already been mentioned that coffee was among the various tropical plants introduced into this island by the Europeans. Soon after New Caledonia was annexed by France in 1853, the Catholic Mission successfully undertook to grow coffee and the first exports, amounting to some fifteen tons, were sent to Sydney in 1863. However, at that stage, many other cash crops were being developed. It was only at the end of the nineteenth century that the then Governor Feillet decided to launch an ambitious European settlement and agricultural development scheme, based largely on coffee growing.

As in the case of many other territories in the tropical Pacific, this development scheme was only concerned with European ventures. In those old colonial days, it was frequently and openly stated that the New Caledonian natives were fast disappearing and would soon become practically extinct, as in the case of the Australian aborigines. This depopulation was indeed well on the way in the latter decades of the nineteenth century. Accompanying the debilitating effects to the Island populations were the insidious but no less shattering effects of the clash of cultures. Not until after the initial stages of culture contact did the natives' acquisition of new economic ideas lead to a reorientation of agricultural objectives. When they did undertake cash cropping, it was natural that this cropping should be based initially on those crops that were native to the Islands, and of these the coconut palm was by far the most important.

The beginning of native commercial agriculture thus represented a reorientation of existing agricultural practices rather than the introduction of entirely new practices. Native cultivation of crops introduced by the Europeans themselves involved a far greater agricultural revolution, and this has been a much slower process, which has only begun to make great strides in recent years. Nevertheless, as early as the mid-nineteenth century, some native villages were trying, with the help of missionaries and sympathetic well-wishers, to develop some form of cash farming. Thus, in New Caledonia, the naturalist Vieillard in 1863

successfully encouraged the Melanesians of one village, Wagap, to grow tobacco, but unfortunately initiative of this kind was sporadic.

The natives were considered useful only as indentured labourers for the European plantations. Working there, they learned on their own initiative how to grow coffee and process the berries. From the European plantations, they brought coffee seedlings into their reserves and planted

TABLE 1

Market-Oriented Production of Indigenous and Introduced Crops in South Pacific Territories c. 1958

(Unless otherwise stated, production figures are in tons)

	INDIGENOUS CROPS		INTRODUCED CROPS	
TERRITORY	TYPE	PRODUCTION	TYPE	PRODUCTION
Australian New Guinea	Coconuts	85,000	Coffee	379
			Cocoa	4,000
Papua	Coconuts	13,233	Rubber	4,259
			Coffee	3
			Cocoa	45
New Caledonia and Loyalty Islands	Coconuts	1,499	Coffee	2,206
Fiji	Coconuts	22,445	Sugar	191,833
			Bananas (cases)	148,604
New Hebrides	Coconuts	33,840	Cocoa	856
			Coffee	278
Solomon Is. Protectorate	Coconuts	20,868		
Western Samoa	Coconuts	14,325	Cocoa	4,034
			Bananas (cases)	884,555
Tonga	Coconuts	27,332	Bananas (cases)	158,595
French Polynesia	Coconuts	22,198	Vanilla	177

them around their villages. There was, however, no large development of native coffee plantations and the decline of native population continued steadily.

From 1920 on, Captain Harrel, an officer of the French Gendarmerie in charge of the Native Affairs Department, and in 1931, his successor, Captain Meunier, anxious to stop the decline of the New Caledonian native population, launched an energetic campaign to improve living conditions in the villages. Housing was improved, medical care intensified, and coffee growing was made compulsory on the reserves. It goes without saying that many European planters were not very enthusiastic about this progressive and successful policy. Today, 1,500 tons of coffee are exported to France from New Caledonia, the larger part of this export being native-grown.

Changes of this kind took place in many South Pacific islands. The table above gives an indication of the relative importance of introduced crops in the export production of both European and native groups in some of the Island Territories of the Pacific.

The extension of coffee plantations on native lands resulted in appreciable changes in the traditional subsistence horticulture. There was competition for land and labour between the bush-fallowing gardens and the perennial coffee plantations; the result was that a more sedentary type of subsistence gardening appeared, based not only on some varieties of the traditional food plants but also on introduced species such as the *yautia* (*Xanthosoma sagittifolium*) and cassava (*Manihot utilissima*), which were more easily grown. Modern garden tools replaced the old digging sticks, and today fertilisers are beginning to be used in the gardens of some villages.

CONCLUSION

The above historical sketch and table give an idea of the role of plant introduction in the economic development of the Pacific Islands in relation to their economic development.

The South Pacific Commission has had plant introduction on its programme since its inception, and since 1957 it has introduced and distributed in the various Pacific Territories more than 250 species and varieties of economic plants. It has thus continued, and indeed accelerated, the revolution in the economy of the island world initiated by the European introduction of new food plants from the seventeenth century onwards.

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The Changing Face of Rural China

KEITH BUCHANAN

"Le visage même de la Chine, la face du pays, est en train de changer à une vitesse vertigineuse."
René Dumont[1]

IT has long been customary among writers on the social and economic development of Chinese rural life to emphasise the static, changeless, quality of the rural scene. Belden, in his vivid account of the background to revolution in China, stressed this point:

"Agriculture, for forty centuries the unchanged basis for development, advanced by intensive means, becoming not farming but gardening. Condemned by unbroken memories and practices of four thousand years, these ancient people brought with them into modern times an intolerably heavy burden from the past."[2]

Recent work, however, and especially the work of Professor Ping-ti Ho, has shown that Chinese agriculture has been far from static over the last two millennia; major technological changes, in the shape of the introduction of new crops, have taken place from time to time and these have produced significant changes in the rural landscape. The early-maturing rices, introduced at the beginning of the eleventh century, helped ensure the success of double-cropping, made possible the utilisation of the higher land and slopes and provided the economic basis for a great expansion of population in south China.[3] Wheat, millets, and other dry land crops spread widely in the rice region during the Sung Period (970–1279 A.D.), making possible the utilisation of formerly marginal areas.[4] Finally, from 1550 onwards the spread of American crops—maize, sweet potatoes, Irish potatoes and peanuts—made possible the intensive settlement of the upland country of central and south China and the sandy loam terrains unsuited to rice. This last agricultural revolution is still continuing.[5]

These revolutions resulted in important changes in the Chinese rural scene. They were, however, regional or local rather than national in their impact and they did not greatly touch the social conditions under which agriculture was carried on. In this respect they contrast strikingly

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[1] Dumont (1959): 51.
[2] Belden (1952): 135–136.
[3] Ping-ti Ho (1959): 173–176.
[4] Ping-ti Ho (1959): 176–183
[5] Ping-ti Ho (1959): 184–189.

with the revolution in the Chinese countryside initiated when the Communists came to power a decade ago. This latest revolution has affected all areas of the country; it has resulted in a far-reaching transformation of the physical and biological environments; it has brought about a restructuring of rural society and has created new relations between agriculture and industry. It is the purpose of this article to describe briefly the origins of this latest revolution, its stages of development, its manifestations in the Chinese countryside and some of the features of the new rural society which made its achievements possible.

POINT OF DEPARTURE

The basic features of rural life in old China, above all, its corroding poverty and hopelessness, have been described by many writers, perhaps most graphically by novelists such as Pearl Buck[6] or Evan King.[7] Sharper statistical focus is given by René Dumont's careful sample studies of a series of Chinese communities.[8] These studies provide an objective picture of the weaknesses and problems of the traditional rural society and indicate clearly the main factors responsible for the poverty and hopelessness of the peasantry. Especially significant, in the light of recent developments, is his opinion that even more destructive than the general poverty was the progressive deterioration of conditions; this deterioration,

> ". . . was taking away all hope and was leading to revolt. China exported less and less silk and tea and the production of foodstuffs failed to keep pace with the growth of population. Impoverishment accentuated exploitation: the situation was becoming fatally explosive. . . ."[9]

The general character of rural China's problems can be illustrated by Dumont's data for a sample north Kiangsu community; the data is given below:

	Families	Arable land	Buffaloes
Landlords	12	441 ha	45
Rich peasants	45	24 ha	
Middle peasants	11	6.4 ha	26
Poor peasants and wage earners*	845	—	3
TOTAL	913	471 ha	74

* Including 314 middle peasant families without land.

Source: Dumont (1957A): 30–31.

The total population supported by the community's 471 hectares of arable land was 3,936; the "nutrition density" was thus 837 per square kilometre or almost 2,200 per square mile. Ninety-three per cent of

[6] Especially *The Good Earth*, New York, 1931.
[7] *Children of the Black-haired People*, London, 1957.
[8] Dumont (1957A).
[9] Dumont (1957A): 33.

the arable land was, however, in the hands of a dozen landlords and the great mass of the population existed by renting tiny plots of land. Rents were exorbitant—forty-three per cent of the value of a normal year's harvest—and even if crops were ruined by flood the rents were still due. Because of high rents, forty hectares remained uncultivated, in spite of population pressure and hunger. The poverty of the peasant meant that equipment was poor, manuring inadequate and cultivation ineffective; the rich peasant achieved yields of thirty-eight quintals to the hectare while the poorer peasant on a contiguous plot attained only twenty-one quintals. Productivity was, moreover, falling; in the words of a villager: "In normal times only the men stooped to harvest but now, with the rice starved of manure, even the children must bend their backs."[10] The equilibrium between population and food supply "poised always on the knife edge of starvation" was becoming increasingly precarious. It could be shattered by drought or flood. Floods reduced more than one quarter of the entire population to beggary and the great floods of 1931 left a bitter legacy of peasant indebtedness and land concentration.

Here, in a single community, are presented in sharp focus the basic agrarian problems China has tackled in the past decade: the uneven distribution of land, the exploitation of the peasant masses, the institutional barriers, in the shape of poverty and high rents, to increased productivity or even full use of the land, and the vulnerability of a backward, poverty-stricken, society to natural calamities such as flood or drought. The massive changes in the landscape of rural China are the expression of the Chinese people's determination to solve these problems and create a new "world of plenty".

CO-OPERATIVES, COMMUNES AND CADRES

Agriculture in old China suffered from two sets of problems: firstly, there were the limitations of the physical environment—soil poverty, shortness of growing season in the north, and natural calamities such as flood, drought, or locusts; secondly, there were the social and economic problems—the instability and ineffectiveness of the Central Government and a landholding system which exposed the peasant to ruthless exploitation. The two groups of problems were interrelated since the first group of problems, whose solution called for a technological revolution, could not be tackled until a satisfactory institutional framework had been provided. There is an obvious parallel with eighteenth century Britain where the new techniques of the Agricultural Revolution could not be widely applied until enclosure created the appropriate institutional framework.

[10] Paraphrased from Dumont (1957A): 31.

Land reform, giving the land to the tiller, initiated the social revolution in the Chinese countryside. The development of co-operatives resulted in more economical units of management and helped to remove some of the social and economic barriers to expanding productivity. For some purposes, such as flood control or major development projects, the co-operative was still too small a unit. Consequently, in 1958 the co-operatives were merged into a series of giant communes, often coextensive with a single county, and whose administrative personnel merged with that of the county. The transition from a system of co-operatives to one of communes was rapid; it began in the middle of 1958 and by late autumn of that year, when the writer was in China, nine-tenths of the peasants had adopted the commune as the basic unit of organisation. Some figures will give this general picture precision: in 1957 the 110 million peasant families of China were organised into 700,000 farm co-operatives; by November 1958 these had merged to form 25,000 Peoples Communes.

Two aspects of this change should be stressed, for these provide a basis for understanding the tremendous pace of change in the countryside. First, because it wiped out landlordism and feudal survivals, the 1949 Revolution was, in a very real sense, a Liberation. It was, moreover, broadly based and carried through with the enthusiastic support of tens of millions of peasant families and it thus helped to destroy the shackling hopelessness and helplessness which impeded peasant progress. As one Chinese writer put it:

> "Revolution, land reform and success in co-operative farming have given the peasants a realization of their collective strength; they feel today that they can conquer the fates, the mountains and the rivers, and remake nature."[11]

This new-felt, heady, sense of power is today a major theme of folk art and poetry in China; it provides the psychological drive behind the striking achievements of recent years. The second aspect which should be stressed is the chain-reaction quality of institutional and environmental change; for if social change made possible the shaping of a new environment, so, too, the process of remodelling the environment itself stimulated further change in the institutional pattern. "As men transformed nature their own way of thinking was transformed too."[12] As more ambitious schemes of water conservation or afforestation were initiated, the need for bigger community groupings with bigger resources of capital and manpower became obvious. The co-operative was too small a unit for such schemes—and thus the new commune system was born.[13] It was born in the countryside, from the experience of the

[11] For this changed attitude see "An Outburst of Popular Poetry": *China Reconstructs* (Oct. 1958): 24–26.

[12] Yang Min in *Peking Review*, 21 Oct. 1958: 12.

[13] See Strong (1959).

peasant masses, and not, as many have suggested, imposed arbitrarily on the peasants by an edict from Peking. Only if this "grassroots" origin of the commune system is appreciated can its enthusiastic adoption by the peasants through the length and breadth of China be understood.

The typical commune may contain scores of villages, even small towns, and its average population, from the figures quoted above, is of the order of 20,000 people. Given the great diversity of agricultural systems in China, it is, however, obvious that there will be a wide variation in area, population and intensity of land use. This variation is illustrated by the outline details for four communes given below.[14]

1. Commune near Peking: Population 22,500 households, of which 9,000 are peasant households, grouped in 129 villages, area 10,000 acres. Formed by merging of 8 co-operatives. Emphasis on vegetable growing, including glass-house cultivation. 14 Tractors.
2. Commune near Lanchow: Population 3,000 households. Emphasis on irrigated production of vegetables and fruit, with some wheat and maize. Stock includes 4,000 pigs, 3,000 sheep, 110 milch cows (an innovation), 20,000 poultry and 70 hives of bees. 5 tractors, 1 lorry. Commune runs 12 primary schools, 1 middle school and a veterinary school.
3. Commune near Chengtu: Population 14,500 households. 18,000 acres under crops, mainly rice, with wheat, vegetables, tobacco, potatoes and hemp. Live-stock includes 35,000 pigs, 2,000 oxen. Commune possesses 5 tractors, and runs a wide range of industries such as woodworking and alkali manufacture. It runs 286 dining halls, 282 nurseries, 119 kindergartens and 39 primary schools.
4. Minority (Yi) Commune, near Kunming: Population 4,800 families. 9,000 acres of land, one-third irrigated lowland, two-thirds hill land. Stock 4,000 buffalo and oxen, 6,300 sheep, 10,500 pigs. The commune runs 21 native-style blast furnaces, turning out some 20 tons of pig iron weekly; 20 brick kilns; limekilns; and woodworking industries including simple agricultural machinery.

The administrative and ideological significance of the commune has been commented on by the Indian economist D. D. Kosambi; with the development of the commune:

"The state mechanism has begun to wither away. Control over people has been replaced by the people's control over things . . . the Chinese people have been the first to take this great step towards the real beginning of human history."[15]

If Kosambi's interpretation is correct, this is indeed a major achievement. More important in the present context, however, is the contribution of the commune system to the accelerating economic advance of the last eighteen months. The commune possesses, as suggested above, resources of capital and manpower which enable it to undertake large-scale development projects, and to cope with crises, such as the floods and droughts of 1959, which would have overwhelmed the individual farmer or even the individual co-operative. It provides the institutional

[14] Field data collected by the writer in October-November, 1958.
[15] Kosambi in Huberman and Sweezy (1959): 8.

framework within which the cadres and the peasant masses can apply improved farming techniques and lay the foundations of a widely-dispersed rural industry. As a social unit organising education and welfare services, its schools and technical institutes make possible the marriage of modern science and traditional peasant wisdom and their application to the basic problems of rural development; its canteens and laundries and communal grain mills release tens of millions of women from the tasks of grinding grain, carrying water and cooking under primitive conditions for productive labour in its fields or its factories. These very real social and economic advantages of the commune, together with its "grassroots" origin, help to explain the swiftness and the ease with which the peasantry carried out "this second revolutionary advance in ten years".[16]

It is usual in geographical studies to avoid discussion of purely political matters. In states with a "liberal democratic" pattern this is defensible, since much of the economic life lies, by definition, outside the control of the state. In socialist-type countries, by contrast, the state plays a direct role in guiding and controlling economic development; without such control, it is held, the state would have only an illusion of power. For this reason, it is impossible to understand the changing geography of China without reference to the role and character of the Chinese Communist Party. China's rural transformation would have been impossible without an energetic direction of all social and economic forces, based on a clear awareness of the possibilities of development and of the interrelations of various sectors of the development plan. Such planning cannot be imposed from above but must spring from an awareness on the part of the people as a whole. In this context the Communist Party has played a vital role. As one French observer has put it:

> "It is through it that the millions of bits of elementary information 'rise' which, at every moment, make the estimation possible of various courses; it is within the Party that conclusions and a line of development emerge; it is also through the medium of the Party that the conclusions and ensuing directives make their way in a clear and precise way to the masses, who alone can transform a correct theoretical vision into effective practice."[17]

The Party's role has been strengthened by the existence of a core of cadres, springing from the peasantry and tempered by long years of war, who have played a vital role in the country's renaissance. They have guided and shared the experience of the peasant masses; they have patiently explained and reasoned with the peasantry; they have swept aside old prejudices and liberated the powerful productive forces that are rapidly transforming the face of rural China.[18]

[16] Kosambi op. cit: 5.
[17] C. Bettelheim in Huberman and Sweezy (1959): 33–34.
[18] On the "new rural élite" see Dumont (1957A): 389–391.

TURNING LABOUR INTO CAPITAL

One of the major changes in the Chinese scene during the past decade has been the re-evaluation of the country's "population problem". Traditionally China has been regarded as an overpopulated country and her massive and expanding population as a "burden". Today, the very size of this population is one of the major factors in the rapid economic development of the country and in the sweeping transformation of the rural landscape. The population has become, to quote Bettelheim,[19] "an enormous source of capital accumulation, (devoting) part of its labour . . . to the increase of the productive potential of the country". It is the great density of China's rural population that has made possible the extension of irrigation works and of flood control schemes, the terracing and afforestation and the widely dispersed rural industries, all of which add greatly to this productive potential.

The enormous latent productivity represented by the underemployed masses of Asia was stressed by Dumont; his view, expressed originally in 1954, has a prophetic quality:

> "Monsoon Asia's greatest source of wealth is her huge population. The main cause of her backwardness is the inefficient employment of this labour force. . . . Even without modern equipment, the resumption of certain types of work by the peasants during the seasons of underemployment on the land would represent a net gain and a productive exploitation of a natural source of wealth. Applied to large schemes of irrigation, drainage and flood control, this work would rapidly raise the level of food production and increase the amount of work which could be performed by a better-fed labour force the following year; the ascending spiral of production would definitely have begun."[20]

The degree of underemployment is evident from Dumont's sample studies; they showed that the peasant was working in the fields for an average of fifty to 250 days, according to region.[21] In some areas:

> "The poor peasants' former winter idleness had not been wholly due to lack of working capital. It was, to a considerable extent, a means of burning up less energy—and food—and the reclamation of waste . . . demanded a degree of stamina which an empty stomach could not provide."[22]

The peasant, in short, was the victim of a vicious circle in which poverty bred inefficient farming and this, in turn, more poverty.

The tapping of the immense reservoir of underemployed labour presented major problems. Much of it was of a seasonal character yet this seasonal variation did not mean that over the slack period fewer men were working but rather that most of them were working fewer hours per day. The surplus labour, under these conditions, could not readily be invested in capital formation. Before this labour surplus could be so

[19] Bettelheim in Huberman and Sweezy (1959): 20.
[20] Dumont (1957B): 162–163 (the original French edition appeared in 1954).
[21] Dumont (1957A): 356–357.
[22] Crook (1959): 71.

utilised, a radical reshaping of the institutional pattern was essential. It is in this context that the development of the co-operative and the commune was so important for these made possible the beginnings of a rational use of labour.[23] Farm work could be attended to by fewer workers, working full time, and with some specialisation, and the labour of the remainder was made available, if only seasonally, for long-term improvements such as irrigation, terracing, or the creation of rural industries, all of which represented increases in the productive potential of the countryside. By 1958 this underemployment had been wiped out; C. Bettelheim estimated that the average peasant worked over 300 days a year[24] and electrification and mechanisation were being pursued as solutions to the growing labour shortage.

The developments made possible by this massive investment of labour fall into five broad categories:

Irrigation and flood control
Afforestation and desert control schemes
Elimination of pests and diseases
Intensification of agriculture
Rural industrialisation

These various developments are briefly outlined below.

TOWARDS THE ELIMINATION OF DROUGHT AND FLOOD

Among the factors responsible for poverty and suffering in Old China drought and flood ranked high. They impinged on a peasantry which lived always close to the margin of existence, which possessed few accumulated reserves, and which was isolated by a primitive transport system. They depopulated vast areas, reducing the survivors to debt bondage and cannibalism. Drought was the cause of the greatest famines; the 1877–1878 famine on the loess plateau resulted in between nine and thirteen million deaths, and was equalled by that of 1928 which caused three million deaths in Shensi alone. Floods became more frequent as increased run-off and silting of rivers followed the deforestation and agricultural colonisation of the uplands. The 1931 Yangtse floods rendered twelve million homeless, those of 1935 affected fourteen million people; the breaking of the Yellow River dikes in a desperate attempt to stem the Japanese advance in 1938 resulted in some 890,000

[23] On this see Gill in Huberman and Sweezy (1959): 48–49. Gill observes: "To release surplus manpower for capital formation, seasonal underemployment . . . has to be converted into seasonal unemployment. That, in turn, requires that farming should be transformed from small-scale unorganised activity into large-scale organised enterprise" p. 49.

[24] Bettelheim in Huberman and Sweezy (1959): 23.

deaths.[25] The elimination of these catastrophes by the extension of irrigation and by river control schemes would make an obvious and major contribution to the stabilisation and improvement of peasant living levels. Such a programme became possible with the establishment of a strong central government; its rapid implementation was assisted by the restructuring of Chinese rural society and, above all, by the development of the commune.

By 1949, and as a result of some three millenia of development, China had fifty-three million acres of irrigated land. By 1955–56 this had risen to sixty-six million acres. In the next year a further twenty million acres were added to the irrigated area, then, in the winter of 1957–58, a further eighty million acres.[26] In eighteen months China brought more land under irrigation than in the whole of her earlier history. At the end of 1958 sixty per cent of the cropland was irrigated; preliminary plans for 1959 aimed at increasing the irrigated area to some 250 million acres or eighty-nine per cent of the cropland, while by the end of 1960 virtually the entire cropped area will be under irrigation. These figures indicate clearly the scale on which labour has been invested in a systematic policy of stabilising and improving the productive capacity of peasant society.

The official policy for water conservation is described as a "three-pronged" one:

> "Build mainly small projects, supplemented by medium and large ones where necessary and feasible; try to accumulate rather than divert water; rely on the people rather than on the government.[27]

The great proliferation of small-scale projects strikes the traveller all over China, and especially in the south; seen from the air the countrysides of Kwangsi and Kwangtung glitter with countless man-made water surfaces. The projects take many forms, according to the nature of the terrain, ranging from the combination of drainage and water storage which has made possible the utilisation of the waterlogged lowlands around Tientsin, to the "water melon" system of irrigation and water storage developed in the dry uplands of the northwest of Hupeh Province. One of the most complex systems was that devised for the North Huai Plain. This area, which supports some 12 million people, has always been a problem area; it "suffered from big floods when there was heavy rain, small floods when the rainfall was low, and drought when there was no rain". Its problems have been solved by the creation of a complex network of canals, totalling some 85,000 miles

[25] Ping-ti Ho (1959): 227–236.

[26] It is claimed that irrigation and conservation work over the period from winter 1957 to autumn 1958 involved the handling of 58,000 million cubic metres of earth and stone.

[27] *China Reconstructs* (May 1959): 17.

in length; within this canal mesh are interspersed wells and storage ponds, partly nourished by underground water from North China. Today:

"The entire plain . . . is a reservoir regulated to prevent both flood and drought. Sluice-gates have been built at all important water junctions so that irrigation is ensured even if there should be no rain. . . . The effectiveness of this system against drought was well tested in 1958, a year when there were 270 days without rain. The average yield of rice for the whole area was . . . half as much again as the previous year, when the weather was favourable."[28]

The smaller projects are constructed by the commune which thus invest the formerly under-utilised labour potential of the peasant in increasing the productive capacity of the countryside. Such a policy means that the Central Government's funds can be devoted to larger multi-purpose projects; thus, while Government expenditure on water conservancy in 1958 was as large as the total expenditure over the First Five Year Plan, the total constructional work done in this field was eight times that achieved over the earlier period.

These smaller projects are important in their own right as helping to expand crop output and reduce or eliminate the catastrophic impact of drought or flood. They are, at the same time, vital elements in a boldly-conceived and nation-wide programme of water conservancy:

"Built along the course of a river above a big project, the small projects enable water to be retained for irrigation, reduce the volume of run-off and thus lessen the pressure on the big project. Those built below the big project make it possible again to store water discharged from the power station and use it for irrigation. Thus a complete system is formed of big and small reservoirs connected by the main river, its tributaries and canals."[29]

The pattern of major water conservancy works is shown in Fig. 1; it should be stressed that the effectiveness of these projects is intimately bound up with the increasing control over run-off and soil loss in the upland country of the west and south made possible by local water conservancy schemes, terracing and afforestation.

The most advanced multi-purpose scheme is that for the control of the Yellow River.[30] Earlier schemes had attempted to cope with the problem of flooding by construction of embankments on its lower reaches. Such a policy was obviously useless for it did nothing to reduce the heavy run-off and silting due to deforestation and destructive cropping in its middle reaches. After 1949 a comprehensive plan for the Yellow River basin was worked out. It envisages the transformation of the main channel into a "water staircase" by the construction of forty-six dams, to be used for flood prevention, irrigation and power, and

[28] *China Reconstructs* (Feb. 1959): 23.
[29] *China Reconstructs* (Aug. 1959): 4.
[30] Teng Tse-hui (1955).

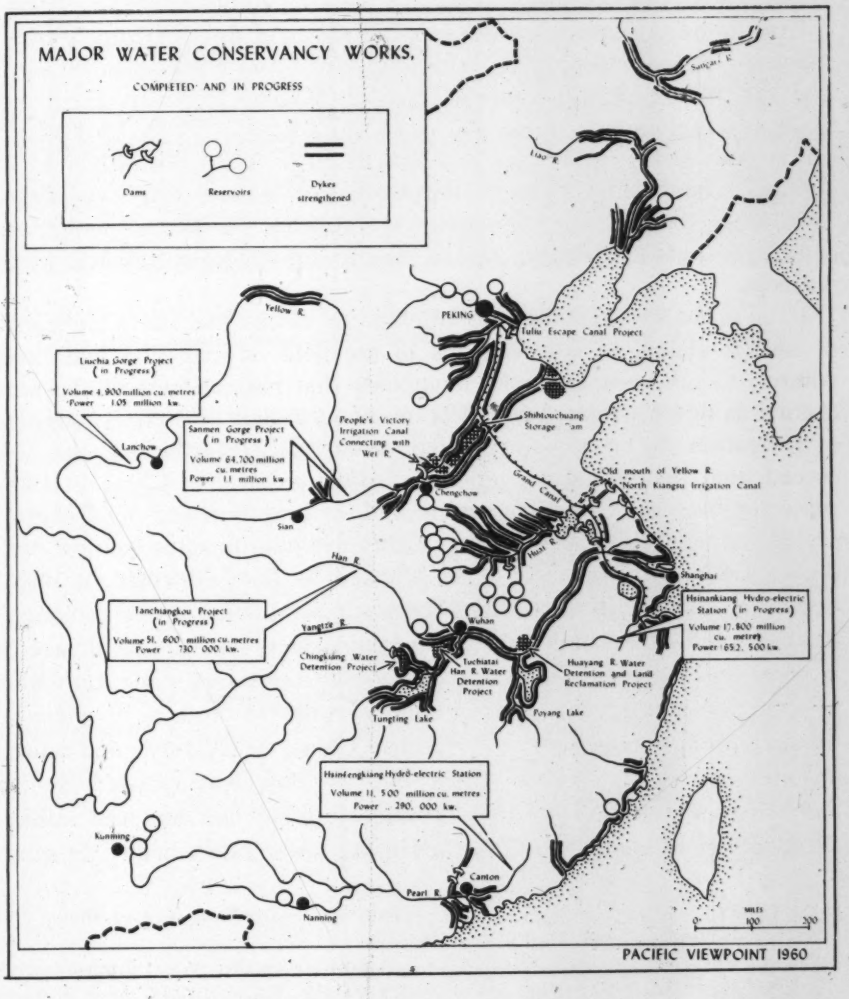

Fig. 1. Major water conservancy works (cross-hatched areas indicate water detention projects). Based on map in *China Reconstructs*, Aug. 1959:4.

the application of soil and water conservation techniques to halt erosion of the loess country through which the river flows in its middle-reaches.[31] This is a long-term project, the first stage being scheduled for completion in 1967. To date, five dams on the main river and four on its tributaries are under construction, among them the giant Liuchia Gorge and Sanmen Gorge projects, and by autumn 1958 some 200,000 square kilometres of eroded land had been rehabilitated.[32]

Even more ambitious is the proposed redistribution of China's water resources by diverting the surplus water from the Yangtse northwards into the Yellow River drainage basin. It is estimated that each year some 142,000 million cubic metres of water could be diverted northwards and survey teams are now carrying out a first investigation of possible canal routes through the watershed between the two rivers. The linking of the two river systems, following the present expansion of the irrigation network, should finally solve North China's water problem.

It is probably premature to attempt to assess the full significance of official claims of achievements in the field of irrigation and flood control; to take one example, it appears that part at least of the area classed as newly irrigated would be more accurately classed as *"capable* of irrigation by newly-constructed works".[33] Nevertheless, the unprecedented floods and droughts that afflicted parts of China in 1959 subjected both the commune system and the irrigation and flood control systems to a severe test. A total of eighty-five million acres (almost one-third of the cultivated area) was affected by flood, drought or insect pests. Of the fifty-four million acres which suffered from prolonged drought, thirty-three million acres were irrigated "to varying degrees"; in some areas, such as Anhwei, recently-built reservoirs made it possible to store the spring rains and, in spite of summer drought, to increase the area under late-sown rice. In central China, heavy July rains caused a rapid rise of the Yellow River but the flow was reduced by the Sanmen Gorge Reservoir which contained some two hundred million cubic metres of water and the dykes in the lower valley held.[34] In south

[31] Nine-tenths of the Yellow River's silt appears to originate in Kansu, Shensi and Shansi Provinces: Teng Tse-hui (1955): 25.

[32] *Peking Review* (22 Dec. 1959): 14–17. According to this report almost twelve million acres of land in the lower valley of the Yellow River were brought under irrigation in 1959.

[33] Chou En-lai (1959): 20. According to Chou En-lai's figures, China's water conservancy works "can irrigate some 166 million acres"; of this, eighty-three million acres can benefit fully and fifty million acres derive partial benefit. The remaining thirty-three million acres "can benefit . . . when the land is levelled and irrigation ditches built".

[34] On 22 July 1959, flood waters poured into the reservoir at the rate of 12,800 cubic metres per second; the flow at Chengchow on the 24th did not exceed 6,000 metres as compared with 10,000 in other flood years.

Photo: Keith Buchanan

Fig. 2. Contour-terracing of bare hillsides prior to afforestation, Lanchow, Kansu. Trees being planted were mainly deciduous types, including fruit trees.

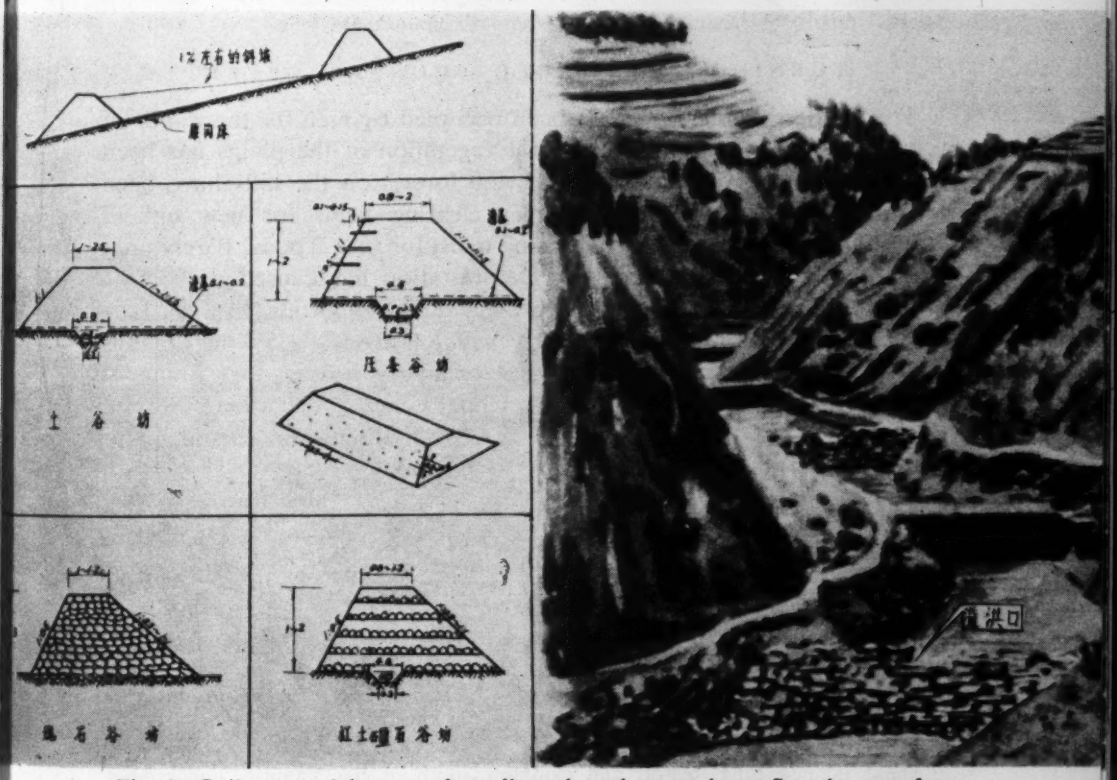

Fig. 3. Gully control by use of small earth and stone dams. Sample page from *Bulletin on Soil and Water Conservation in the Middle Reaches of the Yellow River* (in Chinese), Peking, 1958.

China exceptionally concentrated June rains (578 mm between 11 and 14 June), coinciding with high spring tides, threatened a major crisis; water levels in the Pearl River delta were twenty to forty cm above those of 1915 which saw the worst flood in living memory. Flooding was severe along the East River but loss of life and property was kept to a minimum by flood-prevention work and organised evacuation of danger areas. The completion this year of the Hsinfengkiang Reservoir, which will control forty per cent of the water in the upper reaches of the East River, should finally eliminate the danger of flooding in this valley. In the Pearl River delta the recently-strengthened Great Northern Dyke effectively protected the city of Canton and only 1.3 per cent of the fertile delta area was flooded.[35]

The events of 1959 suggest that, even if China has not yet achieved complete mastery over the twin menaces of drought and flood, they are no longer the "catastrophic deterrents" they have been in the past. Efficient organisation at both the local and Central Government levels, coupled with careful integration of locally and centrally executed schemes of irrigation and flood control, have introduced a new security into peasant life and largely removed two of the major factors making for peasant poverty.

TURNING THE WHOLE COUNTRY GREEN

The Chinese living-space has been occupied by men for thousands of years. Over the centuries the natural vegetation of the plains has been cleared to make way for crop-land; the forests on the hills have been relentlessly destroyed by the farmer clearing fields for new upland crops[36], or as a result of the unceasing quest for fuel. Today, barely one-tenth of the country is forested. Deforestation has caused a shortage of fuel and constructional timber; even more important has been its deleterious effect on the country's river regimes. Because of the obvious advantages of afforestation there has been a vigorous programme of tree-planting, with the slogan "Make China Green". The area afforested during the First Five Year Plan was 28.2 million acres, made up as follows:

Type of Planting	Million acres
Timber	12.9
Industrial trees[37]	5.4
Shelter-belts	3.7
For soil and water conservation	3.5
Miscellaneous	2.7
TOTAL	28.2

Source: *Peking Review*, 22 April 1958: 15.

[35] *China Reconstructs* (Sept. 1959): 16–18.

[36] Ping-ti Ho (1959).

[37] These include tung, tea-oil and camphor south of the Yangtse, and rubber, coconut and coffee in the subtropical south. Dumont (1957): 26, comments on the importance of this tropical fringe to the socialist bloc.

Photo: Keith Buchanan

Fig. 4. View southwards from the Great Wall, showing beginnings of afforestation using pit or "fishscale" technique (note pitting of slope on right foreground). Trees established are mainly deciduous types, including poplar and willow.

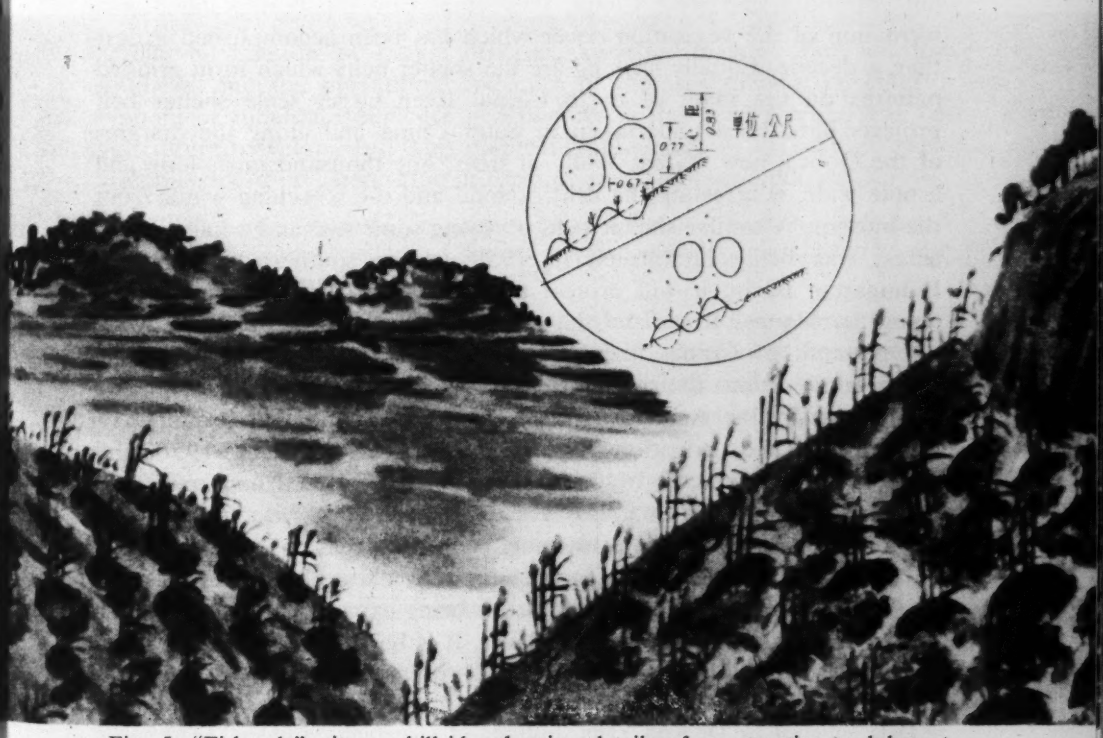

Fig. 5. "Fishscale" pits on hillside, showing details of construction and layout. The pits are here used for millet. Sample page from *Bulletin on Soil and Water Conservation in the Middle Reaches of the Yellow River* (in Chinese), Peking, 1958.

In 1958 a nation-wide drive resulted in the afforestation of sixty-nine million acres; in addition, some 30,000 million trees were planted around villages and along roads and river banks. By April 1959 a further thirty-nine million acres had been planted; within fifteen months, in short, an area almost as large as France was afforested. The target for 1968 is to bring 500 million acres, or twenty per cent of the area of China, under forests.

These achievements have been made possible only by massive investment of labour; on some communes up to fifty per cent of the labour force was seasonally occupied in this work, with each person planting up to 1,600 trees (Chingtu county in semi-arid Kansu).[38] Preparatory work has included elaborate terracing as in Kansu while the "fish-scale" method of planting two to three trees in closely spaced semicircular ditches which intercept run-off has been widely used on rough terrain as near the Great Wall. The emphasis has been on the use of quick growing trees such as willow, *Ailanthus,* eucalypt, poplar and bamboo, though fruit trees may be planted and in some areas (e.g., Kiangsu) the "scale pits" are planted also with sweet potatoes and pumpkins, occasionally even with roses.[39]

Seen from the air, these plantings spread a mist of green over the bare hills of south and west China; they emphasise the remarkable transformation of the vegetation cover which has been accomplished in less than a decade. Equally striking are the shelter belts which form gridded patterns on the plain of north China. Even larger scale shelter belt projects have been undertaken in outer China and along the margins of the Gobi a new "Great Wall" of trees, one thousand miles long and a mile wide, is arresting the drift of sand and the scorching winds from the interior. A similar shelter belt, occuying some two and a half million acres, was being established in 1959 in the southern part of the Dzungarian Basin; it will protect the important cotton-growing region along the Manass River and the western sector of the Lan-Sin railway.

One-ninth of China, mainly in the northwest, consists of deserts. Basic research into the problems of transforming these regions is being carried out by the Academy of Sciences and extensive programmes of revegetation and irrigation have been initiated. Between 1950 and 1958, 3.3 million acres of desert land were afforested and over four million acres sown with grass. The target for 1959 was to bring six million acres of desert land under control, a programme greatly aided by the use of the aeroplane for sowing of grass seed. Further west, in the Tarim Basin, irrigated agriculture is being expanded along the upper and middle reaches of the Tarim River. It is hoped to reclaim some 1.6 million acres and to develop the area as a major grain- and cotton-

[38] Data supplied by Dr Kuo Yang, Institute of Geography, Chinese Academy of Sciences.

[39] Hanwang in Kiangsu.

growing base in west China. To date some 200,000 acres have been reclaimed; much of this is accounted for by some seventeen State Farms, developed and operated by the construction corps of the Chinese army.

The Chinese claim that "man can not only conquer deserts but utilize them for his benefit"; their achievements in their Far West in transforming the landscape are justifying this claim and providing a wealth of research data[40] and practical knowledge capable of application in desert environments elsewhere in the world.

THE FIVE PLAGUES AND THE FOUR PESTS

The remarkable transformation of rural China's biological environment is perhaps less immediately apparent to the traveller than the dramatic remodelling of the physical landscape; it is, however, an equally important factor in the country's economic advance. The conquest of man's parasites and of the diseases they carry and of the parasites of animals and plants is

> ". . . one aspect of the conquest and transformation of Nature, of the cultural revolution which will improve the health of the Chinese people and lift them from their backward condition. This struggle is intimately bound up with the improvement of yields and the development of industry and of agriculture, which can develop only with a healthy population."[41]

The elimination of major diseases, such as malaria and schistosomiasis, and the prevention and cure of diseases such as dysentery, typhoid or tuberculosis, figure prominently in the Twelve Year Plan of agricultural development. This medical emphasis in an agricultural programme would be astonishing in Europe, says Dumont, adding:

> "Nevertheless, the elevation of peasant living levels and peasant productivity begins with improved health, in China as in other underdeveloped countries and this is especially true in the tropical zone."[42]

The campaign for better health has moved forward on a broad front —improved sanitation and water supplies in village and town, mass immunisation, large-scale training of rural medical staff and the establishment of village dispensaries—backed by a widespread publicity drive.

The campaign has been directed particularly against the five plagues —malaria, schistosomiasis, kala-azar, filariasis and hookworm. These have always been of major importance in the warm and humid South where they dragged down the efficiency of scores of millions of peasants and killed their scores of thousands annually. Schistosomiasis was pre-

[40] Some of the fields in which investigations are being carried on are summarised by Coching Chu, Vice-President of the Academy of Sciences, in *Peking Review* (29 Dec. 1959): 11–14.

[41] Lambin (1959): 106.

[42] Dumont (1957A): 342.

valent over an area of south China inhabited by 100 million people, of whom ten million were afflicted with the disease. The parasite has a fresh water snail as an intermediate host and the disease is being eliminated by the cleaning of ditches and irrigation channels and by treatment with modern and traditional methods. It has been wiped out in Fukien and Kiangsu and is being eradicated over the rest of south China. Malaria affected five per cent of China's population in 1949; today the figure has dropped to 0.05 per cent and the disease is significant only in the forest and marsh country of western Yunnan. The campaign against filariasis, kala-azar, hookworm and roundworm follows the same pattern:

> "A war of patience which mobilises six hundred million people against the parasites, according to a predetermined strategy and as an integral part of the agricultural plan."[43]

Like land reform or the control of flood and drought, this revolution in health is lifting a burden from the shoulders of the peasant masses; it is not only adding to the productive potential of the country but eliminating a major cause of suffering and wasted human lives.

The campaign against the "four pests"—flies, mosquitoes, rats and sparrows[44]—is partly inspired by considerations of hygiene, partly by the heavy toll on the national larder exacted by these pests. The slogans of the anti-pest drive emphasise this aspect: "A rat is nine kilos of grain", "Half the wheat and rice crops of Hunan and Kirin goes to fill the stomachs of sparrows". These campaigns have been described by many travellers.[45] Their remarkable success is due above all to the skill and patience with which rural health workers and cadres have expounded to the villagers the fundamentals of rural hygiene and won the whole-hearted collaboration of 500 million peasants.

THE GREATEST AGRICULTURAL ACHIEVEMENT OF THE CENTURY[46]

The great expansion in agricultural production during the last two years has been made possible by the application of the principles set out in the "Eight-Point Charter for Agriculture"; they are: deep ploughing and soil improvement, heavy fertilisation, water conservancy, seed selection, close planting, plant protection, field management and reform of tools. Few of the measures are new but each has acquired new

[43] Lambin (1959): 109.

[44] Han Suyin gives a sensitive account of Peking's anti-sparrow campaign in *The New Yorker* (Oct. 10, 1959): 43–50.

[45] The writer would add his testimony here. In 8,000 miles of travelling in China in autumn 1958 he saw few flies; the Pearl River delta seemed mosquito-free.

[46] The heading is taken from Dumont (1959B).

Photo: Keith Buchanan

Fig. 6. Commune territory near Lanchow. Yellow River in the background. Commune includes irrigated orchards and gardens on flood plain and extensive areas of hill country. Level hilltops are cultivated with "shatin" (pebble mulch) techniques; slopes are being terraced and planted with fruit trees.

Photo: K.N.O.K.S.

Fig. 7. Cotton harvest on Hungwei Peoples' Commune, Kaotang County, Shantung. Note the large fields which have replaced the former scattered parcels of individual cultivators.

Fig. 8. The "Eight-point Charter for Agriculture".

content as a result of the agricultural experience gained in the past decade.

The charter

" . . . is an entity and its eight points are closely coordinated, one supplementing the other. Neglect of one item may adversely affect the crops as a whole. For instance, deep ploughing without adequate increases in manuring cannot yield rich harvests, while heavy fertilisation without deep ploughing will probably invite crop lodging. The eight measures are not dead formulae but call for flexible application. . . ."[47]

The implementation of the measures set out in the charter has been facilitated by the new institutional framework—the commune—whose rise was described above. The scale of the success achieved is explained, partly by the liberation of the peasant from age-old prejudices and attitudes, a liberation which is expressing itself in a great surge of peasant inventions such as improved tools, new planting techniques, experiments in plant hybridisation and the like; partly by the increasing control over the environment made possible by the great water control and irrigation schemes carried out since 1949.

Of the technical improvements, some, such as the use of improved, higher-yielding, seed strains on seventy per cent of the cropped area, bring an immediate increase in yield without additional labour. Others involve an intensification of labour input per unit area, and this intensification in part explains the cry of shortage of labour. An average application of sixty tons of manure, silt and compost to every acre of cropland makes heavy labour demands in an economy where lorries are still few; the rate is ten times that of 1957—and on trial plots visited up to six hundred tons per acre had been applied. Close planting of rice seedlings, giving densities of up to eleven million ears of rice to the acre, and multiple sowing of crops, are labour-expensive techniques. So, too, is the close attention—the weeding, spraying, watering and supplementary fertilisation—which is given to each plant.[48] It is notable

[47] *Peking Review* (23 June 1959): 11.

[48] An important factor in the control of plant diseases is the elaborate network for gathering information about the appearance and spread of disease and pests. By the end of 1958 "there were 678 forecasting stations, 12,000 information centres, and hundreds of thousands of people gathering information."

that mechanisation is still on a small scale, though many of the communes in north China own tractors, and simple equipment, such as irrigation pumps and improved implements, is lightening the burden of peasant toil. Heavy use of artificial fertilisers, which revolutionised Japanese farming, has scarcely begun. Factory output of all artificial fertilisers was 1,375,000 tons in the first six months of 1958; it is increasing and being supplemented by massive quantities of fertilisers produced by "native style" plants on the communes. But even without large-scale mechanisation or heavy use of artificials, the achievements are spectacular enough—for China as a whole grain output increased by thirty-eight per cent in 1958 and total value of agricultural output rose by twenty-five per cent. This is in striking contrast to India where

> "The curve for production of food grains appears to be being overtaken by that of population which is increasing at a rate of 1.8 per cent per annum and will soon exceed two per cent. Cereal output is increasing by between one and two per cent per annum."[49]

The wider implications of these changes hardly need stressing. The Chinese peasantry, one-quarter of humanity, are emerging from the corroding poverty of their past. Bowed down for centuries in back-breaking toil, prisoners of a stagnating agricultural system, they are now lifting up their heads and asserting their capacity to dominate their environment, to bend it to their needs. Man in China is now an "ecologic dominant". The eventual outcome is seen by one Chinese writer in the following terms:

> "With yield per acre rising sharply, China will gradually reduce the area of land devoted to food crops. Hopei Province has already decided to reduce the cultivated area by a half within two or three years when grain yield per acre is expected to reach six to nine tons. More land will be allocated to forestry, animal husbandry and fisheries. . . . When the per acre yield reaches thirty tons, less than thirty-five million acres will be needed for upkeep of 650 million people. Then the entire country will be transformed into a huge garden."[50]

[49] Dumont (1959B): 55.

[50] The concentration of labour, equipment, fertiliser and irrigation water on what are termed "high-yielding" tracts is an important development. It represents a major step towards the "three-three system" advocated by Mao Tse-tung, under which one-third of the arable land would be cropped, one-third afforested and the rest left fallow. See Yang Min, "Revolution in Farming Methods", in *Peking Review*, 28 October 1958, pp. 8–9, and Wang Hsiang-shu, "The Myth of 'Diminishing Returns' ", *Peking Review*, 28 October 1958, pp. 10–12.

It must be admitted that this "brave new world" is not easily reconciled with the traditional picture as presented by J. L. Buck, W. Vogt or, more recently, W. W. Rostow; nevertheless, all the scientists with whom the writer discussed China's food problem were convinced that a solution had at last been found and that, for the measurable future, food production could be expanded to keep well ahead of population growth (2.3 per cent per annum).

Meanwhile, on the communes, increased productivity means a sharp rise in levels of living, a rise expressed in new housing, new school buildings, and the beginnings of investment in producer goods such as tractors. A feature of most villages is the vigorous poster art on the whitewashed walls, exhorting the peasant to ever greater production; such posters are attractive but probably less effective as an incentive to production than the very real evidence of the results of higher productivity which the peasant can see around him in the shape of new schools and housing rising amid the fields of rice or millet.

A NEW PATTERN OF INDUSTRIALISATION

Much of the poverty of old China was the result of an undiversified economy. Large-scale industrialisation had been hamstrung by the organisation of Chinese society and by the disintegration of Chinese life following the impact of the West. Only in the coastal provinces was there any significant development of modern industry[51] and as late as 1952 almost three-quarters of China's industrial output came from the seven coastal provinces and the cities of Peking, Shanghai and Tientsin. In the interior there was little to relieve the drab and monotonous poverty of a stagnating peasant economy.

The situation in the countryside was dramatically changed as a result of the industrialisation programme of the People's Government. The Five-Year Plans place a heavy emphasis on industry but it is a distinctive emphasis, involving simultaneous development of large-scale and small-scale industry, of modern Western-style industry under Central Government control and "native style" industry under the control of the local authorities. The basis for industrialisation is provided by the varied and widely distributed resources of metals and mineral fuels, the expanding output of industrial crops, the abundant hydro-electric resources and the labour power and market represented by 670 million people. The aims of industrialisation are simple: to provide an increasing proportion of the capital goods needed to build a modern economy, to provide the consumer goods needed by an expanding rural population with a rising level of living, and to even out

[51] For some of the problems of early industrialisation in China see Feuerwerker (1958).

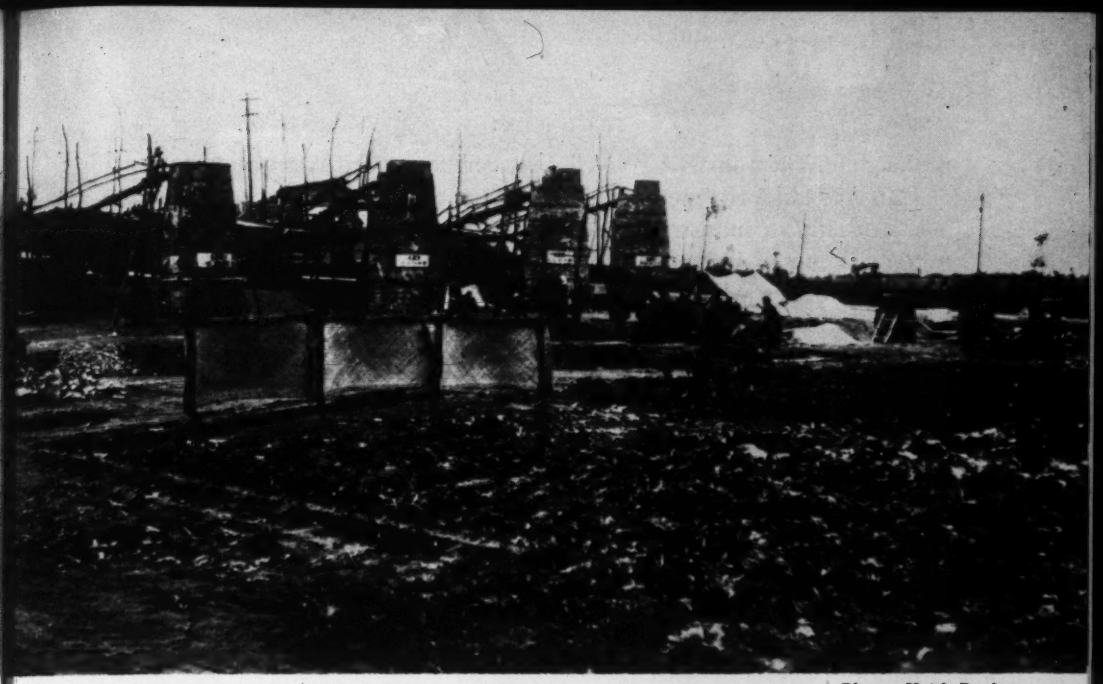

Photo: Keith Buchanan

Fig. 9. "Native-style" blast furnaces under construction, 30 miles north-west of Peking. Batteries of such furnaces, rising dramatically amid the fields of vegetables or cereals, became a distinctive feature of the countryside in 1958.

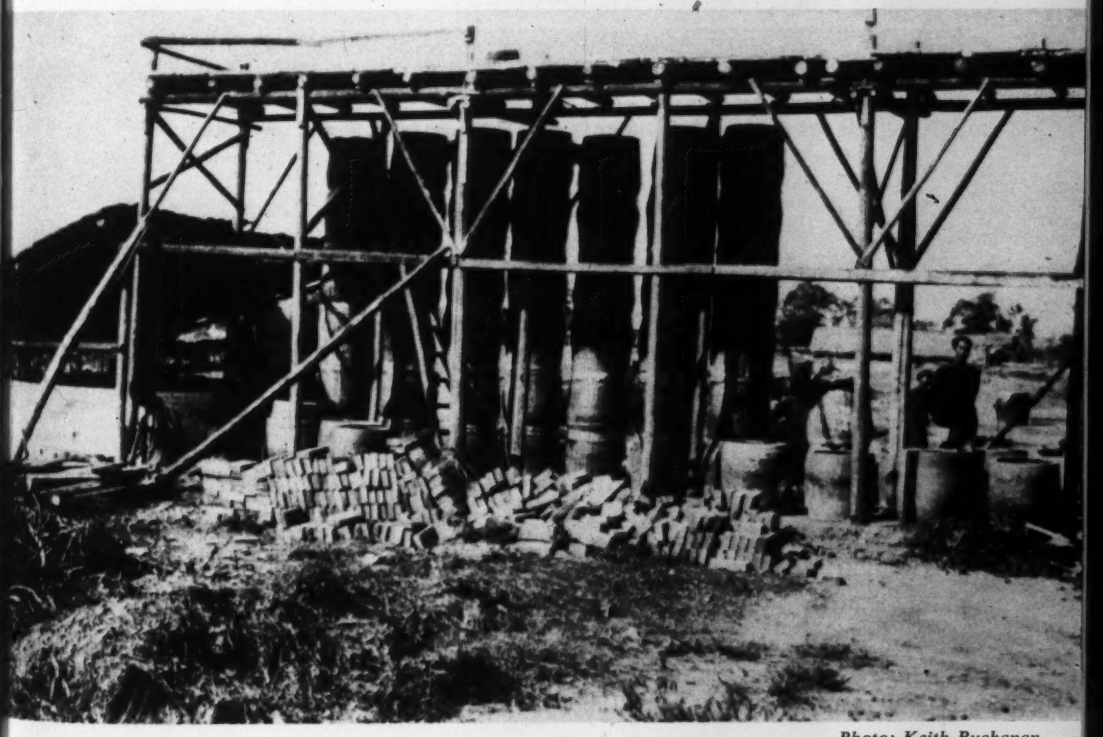

Photo: Keith Buchanan

Fig. 10. Sulphuric acid plant under construction on commune near Nanning, Kwangsi Chuang Autonomous Region. Use of local materials in construction; technical advice supplied by teachers from local technical college.

the differences in living levels between town and country, between the Han and minority peoples. The implementation of this policy means a major shift of industry towards the interior of China and the progressive penetration of industry into the rural areas. This accelerating development of rural industry is one of the most striking changes in the Chinese countryside in the last decade; it is, moreover, a development of major social significance. As Gatti has pointed out, the creation of a series of giant industrial enterprises on the Anshan or Wuhan pattern would have only a limited impact on a country the size of China; its cultural impact would be small and the great mass of the population would remain cut off from the industrialisation and mechanisation which are the basis of modern life. Decentralisation avoids the creation of a new "technocracy" in the heart of the peasant masses and makes possible the maximum diffusion of the new techniques throughout the countryside.[52] Under these conditions the Chinese countryside is developing a personality very different from that of the other emergent nations of Asia or Africa.

In their policy of industrialising the countryside the planners could draw not only on the great numbers of underemployed but also on the tradition of craftsmanship which lingered on in even the poorest village. These non-agricultural activities

> ". . . were all part and parcel of a system which, though based on agriculture, could not function efficiently without other forms of production. Without their secondary occupations the poor peasant families, who constituted five-eighths of the village's population, could not have survived even at their customary miserable level. Ten Mile Inn (the village studied), like other peasant communities, stood on two legs—farming and handicraft."[53]

These human resources of labour and traditional skill, no less than the wide availability of ores, industrial crops or power, have played an important role in the growing industrialisation of the countryside.

This development of local industry is integrated on the one hand with medium- and large-scale modern industry; on the other, it is closely integrated with agriculture. Once established, its continued expansion can be assured only if increasing per capita productivity in agriculture makes possible a continuing shift of labour towards industry. At the same time, the productivity of agriculture can be increased only if rural industries make available better tools—carts, wheelbarrows, rice-husking machinery and the like—and if servicing facilities for such improved equipment are available in each village or each commune. The technical transformation of agriculture and the development of industry must therefore proceed simultaneously.

The range of industries operated by the communes is suggested by the sample details cited above (p. 15). The significance of rural in-

[52] Gatti (1959): 34–35.
[53] Crook (1959): 4.

Photo: Keith Buchanan

Fig. 11. The beginnings of industrialisation in the interior. Handling the masses of crude locally-produced pig iron on a Yi (minority) commune near Kunming. Recently-constructed blast furnace in the background.

Photo: K.N.O.K.S.

Fig. 12. New housing on commune near Chengtu, Szechwan. Improved housing of this type, provided with basic services, is beginning to replace the old mud and thatch huts on the most advanced communes.

dustry can be illustrated by reference to the manufacture of iron and steel and the generation of electricity.

The small "native-style" blast furnace is one of the most publicised elements in China's "Great Leap Forward".[54] Such furnaces produced 4.16 million tons of pig iron in 1958, as against 9.53 million tons produced by modern methods; peasant produced steel was three million tons, out of a total of 11.08 million tons. The advantages of these small units are obvious: they can be built cheaply and with the use of local materials; they can utilise deposits of coal and iron too small to warrant the setting up of large-scale plants; their operation can be organised to fit in with the seasonal rhythm of agricultural activities; by providing iron and steel suitable for working up into farm tools and equipment they cut down the pressure on a heavily-burdened transport system. They vary in size and design and, in the initial stages, they varied greatly in the quality of their product, a defect that was rapidly overcome as the production teams acquired experience. By November 1958, when the writer was in China, it was estimated that 700,000 such furnaces had been built and that some twenty million people were engaged in iron and steel production.[55]

The widespread development of small rural hydro-electric plants was one of the most distinctive developments of 1958. These small plants added some 900,000 kilowatts to the country's installed capacity. They complement the bigger plants, they spread the centres of power supply more evenly, help to speed up the technological revolution in the countryside, and ease the labour shortages created by the intensification of agriculture and the development of industry. They require only a low water head, small investment and no very specialised skills for their construction. Wooden turbines may be used; brick, wood or stone replace concrete in construction. They can thus be built with local labour and with local raw materials and they can be built rapidly. It is realised that such plants do not in any way represent a final answer to the rural power problem; nevertheless, they supply the power that is urgently needed in the initial stages of the agricultural transformation and they supply it cheaply. Even more important, in their construction and operation the peasant acquires experience which will be of major value when larger and more complex hydro plants are built. The saving of labour is illustrated by the experience of one county—Yungchun in Fukien—which, by early summer 1958, had sixteen small hydro-electric stations and twenty-one watermills in operation; these, it was estimated, saved 600,000 labour-days yearly.

These rural industries are an excellent illustration of the policy of turning labour into capital. Individually small, in the aggregate they

[54] Gatti (1959): 38–43.

[55] These figures include urban iron and steel production by "native" methods; this is, however, only a small proportion of the total.

represent a major addition to China's production potential, as the figures quoted for iron and steel production and hydro-electric generation clearly show, and, what is more important in the context of this article, they represent an addition to the productive potential *of the countryside*. Their major long-term significance, however, lies in the fact that they are introducing the peasant to modern techniques and demonstrating to him that industrial development does not necessarily depend on the specialist and the technician, on large-scale financial resources or state aid. Once this lesson is learned, the psychological basis has been laid for an accelerating transformation of the face of rural China.

PERSPECTIVE

This accelerating transformation of rural China is of vital importance to the world; indeed, it is likely to be one of the decisive changes in this second half of the twentieth century. It illustrates how the release of human energies and enthusiasm through a social and political revolution has made possible the creation of an entirely new relationship between man and his environment. It illustrates how, in the shaping of this new environment, new needs and new opportunities have brought into being new forms of social organisation. And if, as seems likely, the Chinese experiment succeeds, the achievement will have a major impact on the uncommitted countries of South and East Asia. The creation, within the framework of a Communist society, of a new world of plenty will be taken as evidence of the superiority of that society by the small and struggling nations on China's southern fringes. At that moment, a new world power balance will be struck.

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Aspects of the Political Geography of Southeast Asia

A Study of a Period of Nation-Building

T. G. McGEE

In the last one hundred and fifty years the emergence of new nation states has been one of the most important political developments affecting the international scene. This was essentially a European born phenomenon, linked with the greater degree of political control made possible by the technological and institutional changes which were part of the Industrial Revolution. With the spread of Western political and economic power throughout the non-Western world, the idea of the nation states has diffused into areas where the nation state, at least on the European model, was not part of the institutional system. As Toynbee has noted, it spread to these areas,

"Not because it had been found by experimentation to be suitable for the local conditions . . . but simply because the West's political power had given the West's political institutions an irrational yet irresistible prestige in non-Western eyes."[1]

This process of nation-building poses fundamental problems to the political geographer. Does the political institution of the "nation state" make possible a more efficient utilisation of the physical environment by man? Can Western political institutions operate in a non-Western environment? What effect does the creation of these new nation states have on the international scene? This article seeks to analyse this process of nation building in one non-Western area—Southeast Asia. In so doing it indirectly comments on the questions posed above.

PHASES OF POLITICAL ORGANISATION IN SOUTHEAST ASIA

Broadly, Southeast Asia has experienced four different phases of political organisation, each of which is characterised by different geographical patterns. Today all four types co-exist, and many problems of the area stem from the attempt to integrate these different forms of political organisation within the framework of the modern nation state.

Historically, the first phase was one of local tribal units. Economic-

T. G. McGee, formerly of the Department of Geography, Victoria University of Wellington, is now on the staff of the University of Malaya, Kuala Lumpur.

[1] Toynbee (1953): 70–71. This point might be taken further. In addition it was the West's economic power and more powerful technology which gave the other aspects of their society such an "irresistible prestige in non-Western eyes".

ally, these were based on either nomadic hunting and fishing, or shifting agriculture. Politically, they were organised into small groups of chieftain societies, although in some the magico-ceremonial basis of their life emphasised the important political role of the shaman. Territorially, the political power was immediate; that is, the tribes generally controlled only the area in which they were located; political power was thus scattered in a series of tribal cells over the countryside. In some tribes control over the land was vested in the chief; in others the land was held in common by all members of the group. These societies possessed only a limited technological equipment for the acquisition of food. This meant that most of their time was spent in the food quest and the consequent delicateness of the ecological balance allowed for little development of specialised political functions. Today, remnants of these societies survive among upland or jungle peoples such as the Mói of Indochina and the Semang of Malaya. Such relict groups present important problems of political integration to the nation state.

The second phase was marked by the dominance of aristocratic kingdoms, a form of political organisation which is thought to have grown up with the invention of irrigation. Wittfogel argues that the development of irrigated agriculture provided the basis for political systems profoundly different from those that developed in the West. In the East,

> "governmental execution of certain vital functions of agriculture (primarily large-scale management of irrigation and defence against floods) involved a co-ordinated and autocratic system of social, political and economic control."[2]

These Oriental despotisms were "semi-managerial states"; they were characterised above all by the fact that the state was "stronger than society"; that is, stronger than the society's non-governmental forces. The nation states which developed in the West, by contrast,

> " . . . encouraged and regulated rather than managed what they considered the crucial spheres of contemporary economic life."[3]

From early times there was thus a fundamental contrast between the political systems which developed in the East and West.

From about the first century A.D. a succession of Indianised and Sinicised kingdoms based on irrigation agriculture grew up in a series of "culture hearths" in the great river basins (Fig. 1) of South-east Asia.[4] They reached their height with such kingdoms as Sukhoithai in the Chao-Phraya river basin, and the Pagan dynasty centred on the Irrawaddy river basin. Other empires grew up based largely on commerce and control of the main trade routes. The outstanding example of such trade-based empires was Srivijaya, which over the period 700–

[2] Wittfogel (1950): 447.
[3] Wittfogel (1950): 447.
[4] de Geer (1928): 205–247.

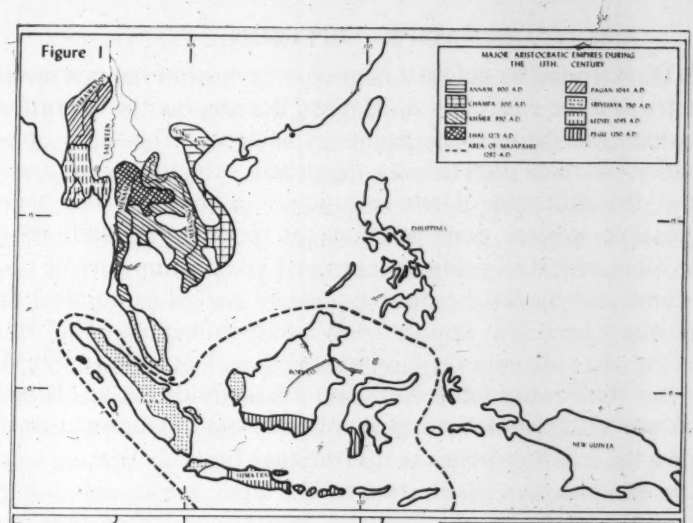


Figure 1
MAJOR ARISTOCRATIC EMPIRES DURING THE 13TH. CENTURY
ANNAM 900 A.D.
CHAMPA 800 A.D.
KHMER 890 A.D.
THAI 1275 A.D.
AREA OF MAJAPAHIT 1292 A.D.
PAGAN 1044 A.D.
SRIVIJAYA 750 A.D.
MONO 1045 A.D.
PEGU 1250 A.D.
PHILIPPINES
BORNEO
NEW GUINEA
SUMATRA

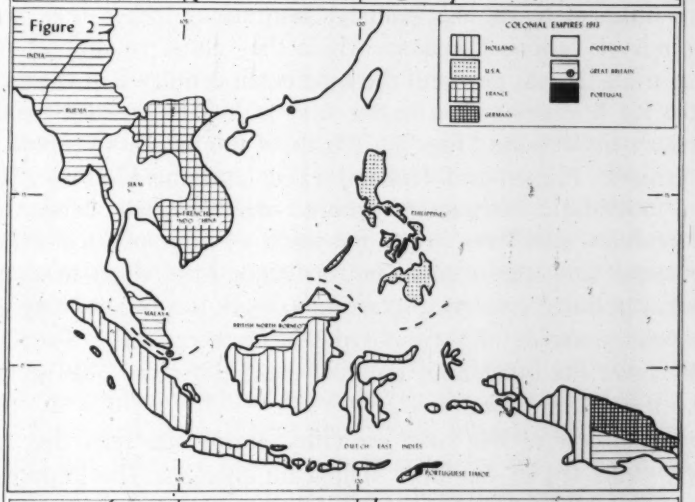


Figure 2
COLONIAL EMPIRES 1913
HOLLAND
U.S.A.
FRANCE
GERMANY
INDEPENDENT
GREAT BRITAIN
PORTUGAL
INDIA
BURMA
SIAM
PHILIPPINES
MALAKA
BRITISH NORTH BORNEO
DUTCH EAST INDIES
PORTUGUESE TIMOR

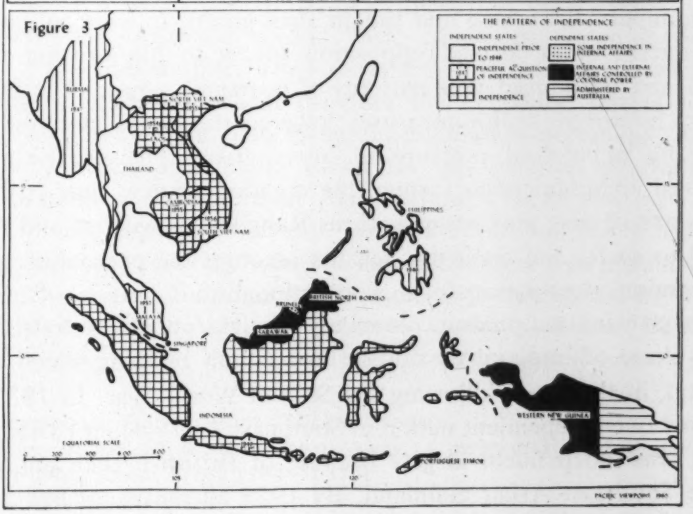


Figure 3
THE PATTERN OF INDEPENDENCE
INDEPENDENT STATES
INDEPENDENCE PRIOR TO 1946
PEACEFUL ACQUISITION OF INDEPENDENCE
INDEPENDENCE
DEPENDENT STATES
SOME INDEPENDENCE IN INTERNAL AFFAIRS
INTERNAL AND EXTERNAL AFFAIRS CONTROLLED BY COLONIAL POWER
ADMINISTERED BY AUSTRALIA
THAILAND
PHILIPPINES
BRUNEI
BRITISH NORTH BORNEO
SARAWAK
SINGAPORE
INDONESIA
WESTERN NEW GUINEA
PORTUGUESE TIMOR
EQUATORIAL SCALE
PACIFIC VIEWPOINT 1965

1350 A.D. extended its political control over most of the northwest coast of Sumatra and the east coast of Malaya, dominating the important trade routes which ran through the Straits of Malacca. This form of political organisation affected the tribally organised sub-stratum of the people little, but the diffusion of the techniques of irrigated rice cultivation made possible greater concentrations of population and this made possible more effective political control of greater numbers of people.

The third and by far the most significant period of political development resulted from the impact of Western influences. This stage was initiated by the advent of Islam which spread over most of Malaysia during the thirteenth, fourteenth and fifteenth centuries. Islam introduced a new religious pattern to Southeast Asia but brought about little change in the existing political institutions. Early European contact, in the shape of economic penetration by Portugal, Spain and Holland, had likewise little effect on the political institutions, other than to cause regroupings of various kingdoms which they chose to support for purposes of trade. It was not until the nineteenth century that the territorial scramble for Southeast Asia began, and with it the radical penetration by Western institutions (Fig. 2). Much of the area was carved up between Britain, France and Holland (and later the U.S.A.). The new colonial boundaries frequently ignored demographic, ethnic and religious realities, and thus sowed the seeds of later political difficulties. At the same time, the colonial powers made little effort to change the indigenous political systems, preferring to work through existing political institutions by means of various types of "indirect rule". Such a policy virtually froze the indigenous political institutions and also set up rival systems of political power.

The expansion of the cash economy during the next one hundred and fifty years led to far more significant changes. The importation of large numbers of Chinese and Indian alien groups to work in the rubber and mineral areas formed opposition forces to the existing political system and introduced new patterns of economic power. The introduction of improved health measures lowered the death rate and led to increasing population pressure in many areas. The provision of an improved communication system, the creation of new cash crop areas, the growth of new port towns such as Rangoon, Singapore and Batavia, all led to social and economic tension amongst the population and laid the economic foundation for a new nationalism.

This growing nationalism ultimately brought about the fourth period —the phase of imperial devolution and nation building which reached a climax in the years following the Second World War. In 1939, there was only one independent nation in Southeast Asia—Siam (Thailand)—and it was independent largely because of British-French antagonisms on the Southeast Asian mainland. By 1958 all the states had achieved

their independence except for Portuguese Timor, Western New Guinea, British Borneo and Singapore (Fig. 3).

There was a clear division in the manner in which the states received their independence from the colonial powers. First there were the states which achieved their independence peacefully; these states were Burma (1947) and Malaya (1957) from the United Kingdom, and Philippines (1946) from the United States. These states escaped the devastation inevitable in a long war of independence and thus possessed a better economic and political structure on which to base their political development. Conditions were very different in the countries of warlike devolution—the various states of French Indochina[5] and the Netherlands Indies—which went through long and devastating wars before they were granted independence. This, of course, led to a much more virulent anti-colonialism, and left to the successor states a bitter legacy of shattered economies and political disorganisation.

FACTORS IN THE GROWTH OF NATION STATES

The problems of nation-building stemmed from many other factors than this immediate phase of "imperial devolution".[6] They stemmed primarily from the distinctive politico-geographical conditions which the state had to build upon. An analysis of the Southeast Asian scene seems to confirm Deutsch's general hypotheses regarding the growth of the nation state; at the same time it suggests that the very different historical experiences and environments of the Southeast Asian countries gave rise to distinctive variants of the general pattern. Secondly, there are the problems which arose during the emergence of the nation states in Southeast Asia. These are closely linked with the first set of conditions, but they are also vitally affected by the geopolitical situation of the area, i.e., its relationship to the world power blocs.

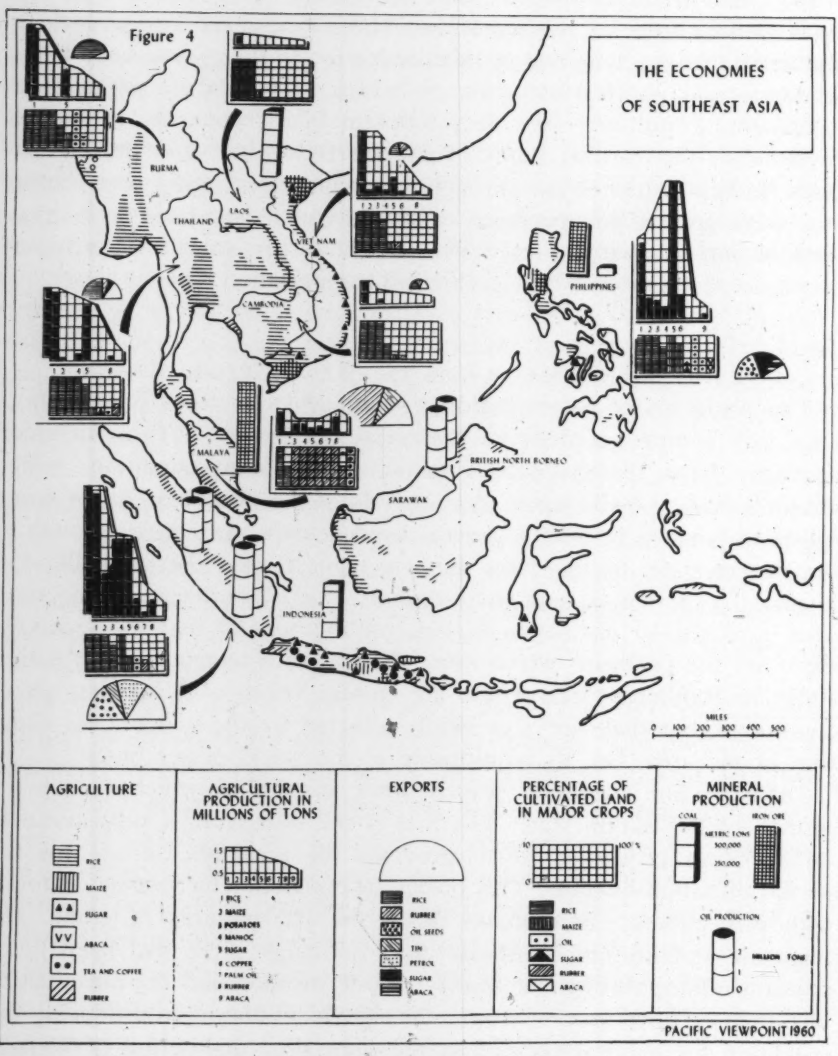
Deutsch[7] has suggested several basic conditions which favour the growth of the nation state. The first is the shift from a subsistence to an exchange economy, which provides the economic setting for the period of nation-building. This brings the population increasingly in touch with one another, and breaks down the old patterns of ethnic and linguistic stability. In Southeast Asia, although there had been much cultural mixing throughout history, Westernisation and the introduction of a cash-oriented economy were the significant factors in producing this condition for nation-building. At the same time this period of Western control left Southeast Asia with major economic problems. Before the Second World War the region's role in the international economy "was

[5] Laos; Cambodia; Cochin-China; Tonkin; Annam.

[6] Devolution is used to mean the break away of peripheral colonial states from the controlling power. Broek (1944): 175.

[7] Deutsch (1953): 168–195.

Figure 4


THE ECONOMIES
OF SOUTHEAST ASIA
BURMA
THAILAND
LAOS
VIET NAM
CAMBODIA
PHILIPPINES
MALAYA
BRITISH NORTH BORNEO
SARAWAK
INDONESIA
MILES
0 100 200 300 400 500
AGRICULTURE
RICE
MAIZE
SUGAR
ABACA
TEA AND COFFEE
RUBBER
AGRICULTURAL PRODUCTION IN MILLIONS OF TONS
1 RICE
2 MAIZE
3 POTATOES
4 MANIOC
5 SUGAR
6 COPPER
7 PALM OIL
8 RUBBER
9 ABACA
EXPORTS
RICE
RUBBER
OIL SEEDS
TIN
PETROL
SUGAR
ABACA
PERCENTAGE OF CULTIVATED LAND IN MAJOR CROPS
RICE
MAIZE
OIL
SUGAR
RUBBER
ABACA
MINERAL PRODUCTION
COAL
IRON ORE
METRIC TONS
OIL PRODUCTION
MILLION TONS
PACIFIC VIEWPOINT 1960

largely a passive one, influenced or controlled by foreign countries".[8] Even after the colonial powers had relinquished their administrative control, they still retained commercial holdings which provided a basis for bargaining with the new nations.[9] Western domination also left a major legacy in the shape of the dual economy. During the period of Western control the vast majority of indigenous people remained engaged in subsistence rice cultivation, while the new money economy developed through the initiative of the European and Asian alien groups. Increasingly, however, the growing of cash crops such as rubber, tea and rice was taken up by the peasants. This was largely due to the need for cash to purchase the Western consumer goods which were coming increasingly on to the market. The value systems of the indigenous peasantry became rapidly oriented towards a cash economy, producing for a world market subject to price fluctuations which the peasant could neither control nor understand. Thus the 1952 *Economic Survey of Asia and the Far East* reported a decline in the deman for principal export commodities despite an advance in the physical volume of production.[10] As a result, all but the rice-exporting countries faced severe problems in financing both imports and internal development plans. Such an unstable economic base presents a major problem to these developing nation states.

The second condition for the growth of nation states is the social mobilisation of the rural population into core areas. The new market economy in Southeast Asia was uneven in its penetration and its impact. It created new cash crop areas such as the Lower Burma region and Cochin-China (Fig. 4). It also led to an increase in cash cropping and population density in existing regions of agricultural development and heavy population pressure, as in Java, Central Luzon and the Tonkin delta. Increasingly these "core areas" tended to become centres of social, political and economic discontent for they were the areas where the problems of parcellation, land tenure, foreign money-lenders, indebtedness, rural unemployment and overpopulation produced severe agrarian problems. Western penetration did not create all these problems; it did, however, intensify the political and social instability of these areas.[11] In contrast to these areas which bore the full brunt of Western impact were the uplands which remained refuge areas, little affected by outside influences. The resulting sharp economic cleavage presents problems of political and economic development. A solution to these problems is doubly difficult since these lines of economic cleavage often reinforce pre-existing lines of ethnic or cultural division.

The third condition for the development of nation states as laid down

[8] *Economic Survey of Asia and the Far East* (1949): 293.
[9] See Mills (1949): 5.
[10] *Economic Survey of Asia and the Far East* (1952): 1.
[11] See Jacoby (1949): 32.

Figure 5

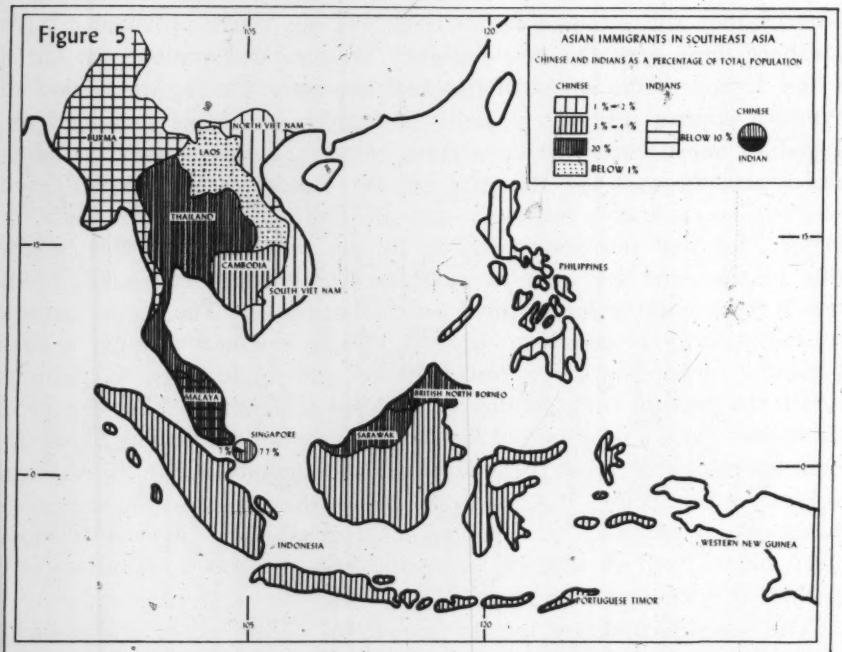
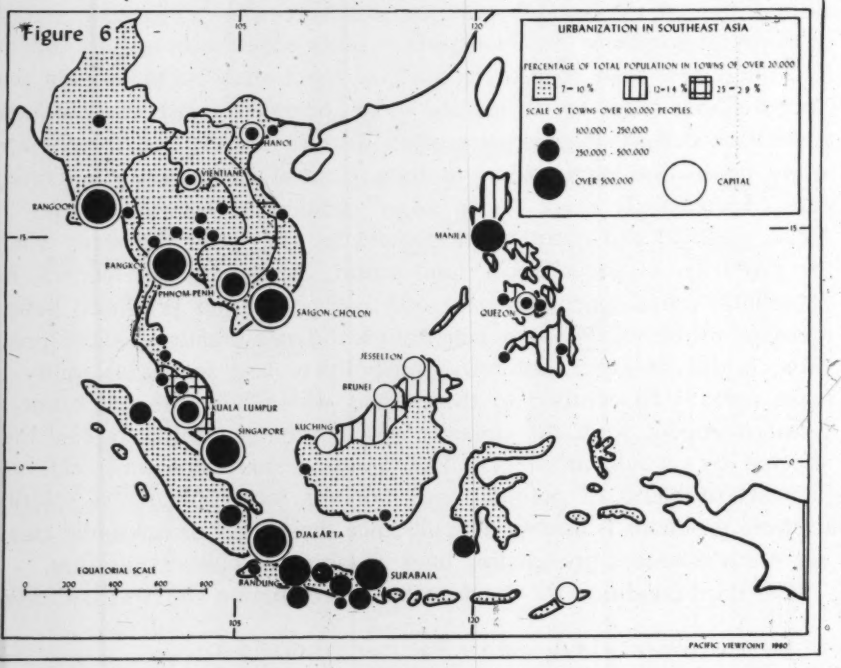


Figure 6



by Deutsch is the growth of towns and the concurrent growth of the middle class. In Southeast Asia these developments took a form vastly different from those of Western Europe, for there was no indigenous middle class and the pattern of urbanisation was largely imposed by the colonial powers. The middle class was recruited from the flood of Asian immigrants into Southeast Asia, who, over the past century, moved into the area to provide labour for Western commercial enterprises (Fig. 5). Local folk and immigrants tended to form what Dobby has termed a "cellular society", each group concentrating in

> "self-contained cultural enclaves—Chinatowns, Indian estate labour lines, Chinese tin mines, Burman, Thai and Malay villages. Each group lived in its own watertight compartment; there was little economic competition and much social aloofness."[12]

In most countries of Southeast Asia the middle class was therefore largely non-indigenous and these foreign immigrants today control much of the wealth of the new nations. Thus in the Philippines it was estimated in 1953 that Chinese controlled forty-two per cent of the investments in commercial enterprises.[13] The pre-war situation in Burma was little better; in 1931 forty-nine per cent of all those who paid income tax were Indians.[14] Practically everywhere it is these foreign groups, in particular the Chinese, who have inherited the economic power of the European colonial groups. With the increasing drift of local people to the large cities and their growing desire to enter urban occupations that are often monopolised by immigrants, it is in the cities that the problems of the plural society will come to a head.

The new states are thus faced with the double problem of integrating the indigenous groups into the money-earning sector of the society and at the same time of integrating the alien groups into their political structure.

It was suggested above that the conditions of urbanisation are very different from those in Western Europe. There is no ordered hierarchy of cities such as geographers have described in Europe. The pattern is dominated by the "million city"—Saigon, Bangkok, Singapore, Djakarta, which are five to ten times as large as the next largest city. These cities grew principally as a result of the colonial pattern of development and are often parasitic in character. As Hauser has said (Fig. 6),

> ". . . they tended to obstruct economic growth in their country of location by retarding the development of other cities in the nation, by contributing little to the development of their own hinterland, by being orientated primarily toward the contribution of services to the colonial power abroad or the colonial or indigenous elite in the city itself."[15]

[12] Carnell (1958): 409.
[13] Kahin (1959): 451.
[14] Thompson and Adloff (1955): 87.
[15] Hauser (1957): 87.

The classic example of such cities was Hanoi; here with the passing of the colonial regime the city has undergone a major economic transformation. In 1954 its parasitic character is shown by the fact that Hanoi bought five times more than it produced—in fact businesses almost exceeded the number of tradesmen and artisans.[16] Since independence a systematic and successful effort has been made to build up the industrial sector of the city. But throughout the rest of Southeast Asia the need to build up industries in the large cities remains one of the basic problems of the new states.

The fourth prerequisite for the growth of nation states is an adequate communication grid.[17] The advent of the West has led to the construction of basic communications, but unfortunately these were designed not so much to unite a country as to tap its mineral and agricultural resources for the colonial powers. Sometimes, as in Burma, this did incidentally unite various parts of the country; here the railway line to the teak forests and oil of the north helped unite this area with the heavily populated lowlands of the Irrawaddy delta. In French Indochina, however, where there was little economic need to link north and south by railway, there developed two separate core areas. This isolation of the great rice bowls of North and South Vietnam was completed by the political fragmentation after the Geneva Agreement. To achieve effective unity and control the new nations were thus faced with the problem of reshaping and extending their network of communications. In this, they were greatly helped by the technological innovations of the "second industrial revolution"—in particular the aeroplane and mass education devices (such as films) which have played a vital role in breaking down isolation and unifying the new countries of Southeast Asia.[18]

Finally Deutsch suggests there must be an awareness amongst the people of the need for the nation-state. To some extent this awareness can be built up through the use of symbols, such as a national flag, which will in time become tangible proof of a people's belief in their nation.[19] Here the former colonial status of Southeast Asia was to prove an asset, for anti-colonialism proved an important unifying and rallying cry for the strident nationalism of the young states. It was, indeed, something more than a political slogan, for it represented a vital unifying force

[16] Limbourg (1956): 30.

[17] See Whittlesey (1939): 23.

[18] Deutsch (1953): 179, cites the economic developments of the Second Industrial Revolution which have a "lift pump" effect on the mass of the population, inducing migrations and culture contact resulting in national assimulation and nation growth.

[19] See Gottman (1952): 512–519.

in the young nations which transcended, at times, practically all forms of group and communal opposition.[20]

Nation-building was thus encouraged by patterns of economic and cultural disturbance similar to those experienced earlier in Europe, but in addition the vastly different historical and cultural background of Southeast Asia presents many new problems. Moreover, there were the more local problems of uniting areas characterised by diversified relief and a tropical climate, possessing a limited industrial resource basis and an unparalleled ethnic, cultural and religious diversity.[21]

THE THREE PHASES OF POST-WAR NATION-BUILDING

In Southeast Asia the process of nation-building can be divided into three broad periods since 1945. The first period was one of establishing internal security and control, while attempting to put the economy on a more solid basis. When internal security and territorial integration had been achieved, the nation state then had to tackle the problem of social and economic development. Finally, there has been a third phase since 1958 in which democratic institutions have collapsed and been replaced by semi-military dictatorships.

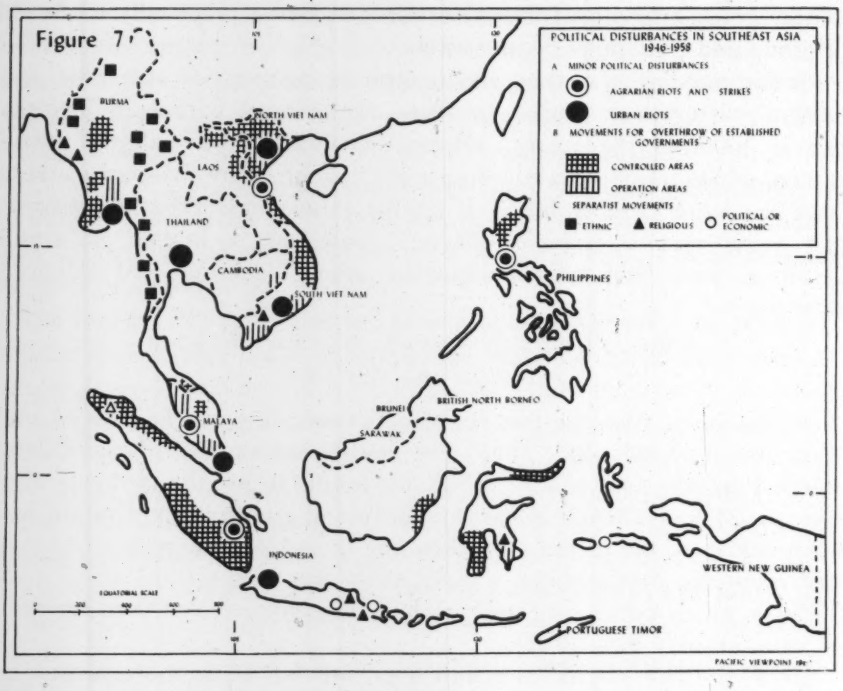
Each of these phases of political growth has been characterised by different types and territorial patternings of political groups. In the following analysis an attempt is made "to describe, classify and map (the) political groups"[22] active in Southeast Asia during the period of postwar nation-building (Fig. 7).

During the initial phases of imperial devolution and the first years of independence, there were two principal types of opposition. First there were the ethnic and religious separatist movements, which differed from the more extreme opposing groups in that they were willing to compromise with the new governments provided they could win recognition of their special ethnic or religious rights. These movements tended to be located in the upland areas. Typical of the ethnic separatist movements were the revolts of Karen and Shan tribal groups, who resented the imposition of political authority by another ethnic group—the lowland Burmans. In Burma a federal framework had to be created to cope with the claims of these groups. North Vietnam had from the beginning followed the Sino-Soviet pattern of creating semi-autonomous minority areas. The religious groups were generally extreme reactionary

[20] It is significant that anti-colonialism as a unifying force is now beginning to wane in Southeast Asia while still remaining in the younger states of Africa. This is a major cause of the split in the Afro-Asian bloc which has developed in the last year.

[21] These patterns have been described and mapped in three previous major articles —Fisher (1950 and 1956) and Broek (1944).

[22] Wright (1944): 194.



groups who opposed state religious control. Typical were the Islamic "Majahads" located in the Arakan area of Burma who opposed the dominantly Buddhist government. Another example was the Darul Islam movement in Java, an Islamic group. Sometimes the religious groups represent a synthesis of Christianity and Eastern religions. Such were the Cao-Daist group of South Vietnam who were particularly active during the period prior to the Geneva Agreement.

Secondly, there were the movements which aimed to overthrow the controlling Government and replace it by another form of political organisation. These groups were chiefly political or economic in their aims; either leftist movements, remnants of old underground fighting groups from the days of Japanese occupation, or reactionary groups generally backed by conservative elements opposed to new, more democratic, systems of government. Although these movements have continued throughout much of the period since 1945, this is purely because of the varying stages at which independence has been attained; in each country they have been at their strongest in the initial period of independence. Territorially, these groups tended to be located in upland areas, relatively close to the main areas of population, estate agriculture and communications. Thus in Burma they were located in the Pegu Yomas range within easy reach of the highly populated areas of Central

Burma; in Indochina, in the upland areas backing the coastal lowlands; in the Philippines they operated from the uplands of North and Central Luzon into the rich, highly populated area surrounding Manila; and in Malaya in the upland areas within easy reach of rich estate areas of the west coast. It took many years for the nation states to establish control over these groups.

The cooperating groups were derived from the Western educated elite and aristocratic groups as well as from movements for national independence formed during the colonial era. The groups they represented were of two types. The first type belonged to the dominant population group of lowland people as for example the lowland Burmans. Secondly, there were the indigenous groups such as Malays who cooperated with the West to retain their declining political power against the infiltration of new immigrant groups. This initial period was characterised by a framework of Western democratic institutions, by a political elite of nationalist leaders and above all by attempts to integrate various warring groups within the state in an effort to stabilise the country.

Once these major problems of integration, security and stability had been partly solved, the second stage of nation state development in Southeast Asia could assume more importance—the social and economic development of the state. Here, once again, regional and urban discontent came to a head. With the exception of the Democratic Republic of North Vietnam and monarchies such as Laos and Cambodia this development was attempted within a type of Western democratic framework which presented many problems. Foremost of these is the problem of the maintenance of obedience.[23] The frequent refusal of pressure groups such as the army to accept decisions of the central government is the cause of much political instability in the area.

However, it was the economic problems of the state which produced the most significant movements of discontent. These fell into three broad groups. Firstly, peasant revolts and unrest occurred. These were not uncommon in Southeast Asia before the war, and were symptomatic of such increasing problems as population pressure and indebtedness. In the second phase of nation-building peasant unrest was more often the result of the governmental efforts to build a new social and economic structure. Thus land reforms frequently produced opposition as occurred in the Vinh area of North Vietnam in 1956. That the democratic Republic of North Vietnam should provide the most substantial example of opposition to land reform is indicative of the extensive change in this country, and the failure of the other new nations to reform their basic agrarian structures. Secondly, there were strikes and riots in estate areas as in Malaya and Indonesia, which reflected the growing power of trade unions and their demand for higher wages. A third type of economic

[23] See Panikkar (1959): 17.

dissatisfaction was distinctly regional in character. Economically undeveloped Southeast Asia has great regional contrasts within countries in terms of economic development, and these present difficulties to integration at the economic and political levels. They were particularly prominent in Indonesia, above all in the islands of Sumatra and Kalimantan, rich in oil and rubber, which contributed almost three-quarters of the total export earnings of the country.[24] Here dissatisfaction with what was regarded as inadequate political representation in relation to the economic contribution of the islands to the revenue of the state, expressed itself in support of the army's attempts to overthrow the Sukarno government. It is against a background of population pressure, unstable agricultural economies, and separatist tendencies that the efforts of the new countries to diversify and build their economies must be seen.

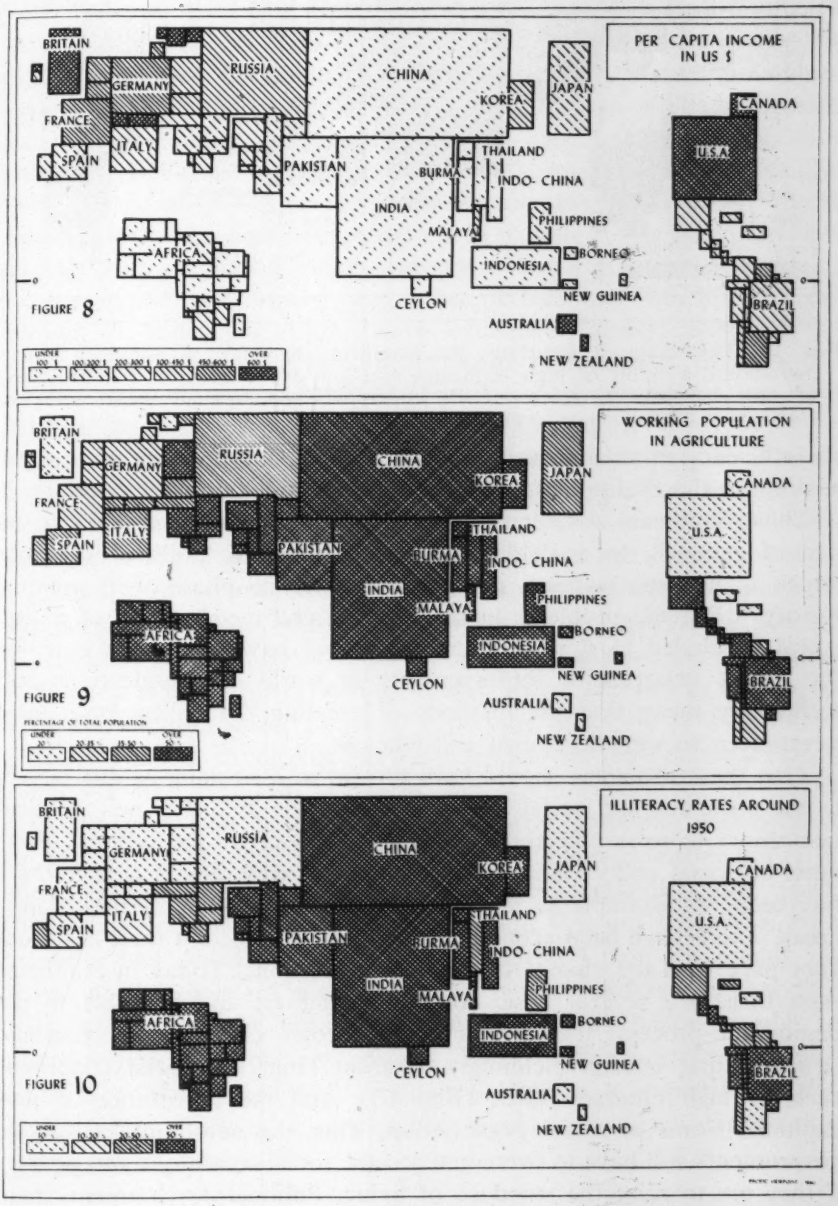
In general it is the failure of these efforts to produce a rapid solution to basic economic problems such as poverty which has brought about the third phase of nation-building. The political elite who succeeded in carrying through independence has failed to

> "create the type of political strength based on organizational integration and control, which would give the countries of Southeast Asia efficient government and administration and thus increase their absorptive capacity so that massive inputs of capital and technical skills could be utilized for development on a broad front."[25]

But the failure to organise the political structure efficiently is only one factor in the collapse of the political systems of these states. Above all the major fault lies in the piecemeal policy of social and economic reform which has nibbled at, but not changed, the basic social and economic structure of these states.

In Southeast Asia after 1958 the republican democratic institutions began to crumble. In Burma on 28 October 1958 General Ne Win, leader of a military faction, took over control of the government which he continues to dominate. In Indonesia, the elections scheduled for September 1959 have not yet been held. In Thailand on 20 October 1959 Field Marshal Sarit took over power and on 28 January 1959 the interim constitution was proclaimed, based on the Constitution of the United Arab Republic, which gives the Prime Minister special powers. Most recent has been the assumption of political power by the military clique in Laos in the first week of January 1960. In North Vietnam the achievement of independence from French control was followed by the setting up of a communist state in 1954. South Vietnam is a virtual dictatorship propped up by American aid. Only in the Philippines and Malaya are democratic institutions working. Both countries, however, have several internal problems which may challenge

[24] Fryer (1957): 197.
[25] Pauker (1959): 329.



Figs. 8–10. Selected Indices of Social and Economic Development in Southeast Asia. These world maps highlight the major problems of the area—undiversified economy, poverty, and illiteracy—problems shared with other tropical areas of the globe. (Size of countries is proportionate to population.)

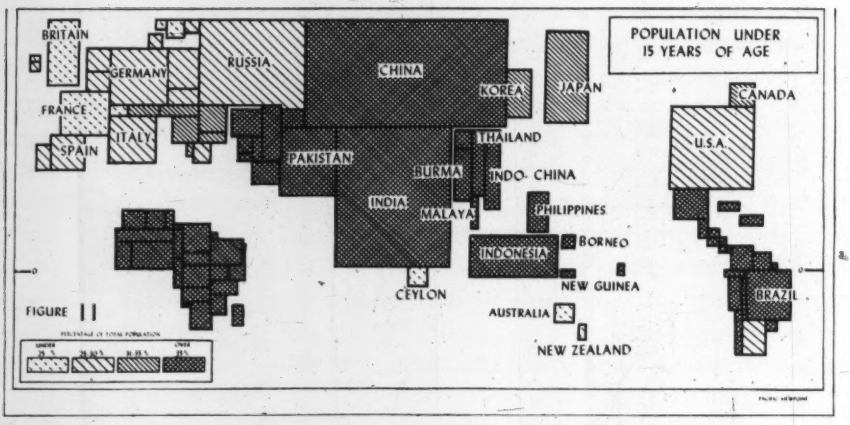


Fig. 11. This diagram illustrates the youthful character of Southeast Asia's population, a result of high birthrates and low expectation of life. This type of age structure is typical of all underdeveloped tropical areas. (Size of countries is proportionate to population.)

the efficiency of their institutions—in Malaya, the problem of a plural society; in the Philippines, an archaic social and economic structure.

Thus, Southeast Asia has turned from an age of democracy to an age of generals, to a rigidly controlled autocratic political structure which is, in some respects, not unlike the second phase of its political history.[26] But the problems in the creation and development of nation states which led to this situation might well have been overcome for the recent unparalleled improvements in world communications and technology mean that the methods of creating the nation state have never been so well developed and efficient.

That these problems should have proved so intractable is due largely to the economic and social backwardness of the area. For new political institutions to work efficiently (especially democratic institutions) there must be social and economic development as well. Social change there has been; an example is the emancipation of women in the Islamic areas. There have been economic developments too, but these have not kept pace with the change in political institutions. Today in Southeast Asia there are several basic conditions that are unfavourable to the democratic process: the low per capita income (Fig. 8), an economic structure that is overwhelmingly agrarian (Fig. 9), social conditions such as high illiteracy rates (Fig. 10), and the persistence of pre-capitalist forms of social organisation. Thus the new Southeast Asian governments still have to overcome archaic social conditions and poverty if they are to raise the standard of living. Political development, then, demands social and economic development—this is under way but is being negated by the rapid population increase (Fig. 11) which offsets any temporary accumulations of capital for economic development.

[26] See p. 40.

SOUTHEAST ASIA IN THE MODERN WORLD

A solution to these problems has been made no easier by the world political position of Southeast Asia. In a world divided into two hostile political blocs, there are three political positions to which Southeast Asia could be drawn. The first, alliance with the Western powers, is officially followed by Thailand and the Philippines within the framework of SEATO and unofficially by the ruling cliques of South Vietnam and Laos. Secondly, there is alliance with the Communist bloc, with which the Democratic Republic of North Vietnam is linked. Finally, there is neutralism—a position between the two great power blocs. India leads the remaining Southeast Asian nations in this group.[27] These varying political choices reflect Southeast Asia's geopolitical position, for the region has always been a shatterbelt into which the great empires of India and China have expanded. Today, although the leadership of India and China in the region is important, the area has become even more important as a vital testing ground for the rival merits of the two great power blocs.

Western policy in the region has been designed firstly to contain the supposed Communist infiltrations into the area, and secondly to buttress the existing social and economic structures through technical and financial aid such as the Colombo Plan and American loans. By contrast, it is unnecessary for the Soviet bloc to be concerned with political measures such as containment. In the struggle for prestige in Southeast Asia the Soviet Union has several advantages. It despises colonialism and is always willing to give moral support to the movements for independence. Bulganin expressed this view in 1955 when he said, "The just struggle of the Asian peoples for their national liberation meets with the deep sympathy and moral support of the Soviet people. . . ."[28] The Soviet Union's successful economic development has also set an example which many of the Asian countries desire to follow. But the greatest prestige card is the geographical fact which Khrushchov emphasises . . . "I want to add that our country is both European and Asian."[29] Since 1955 the Soviet Union has greatly increased its economic aid in the area. This is vastly different in character to the American loans, consisting mainly of interest bearing credits to finance specific development projects. By 1 February 1958 the Sino-Soviet bloc had loaned $175 million to Burma, Cambodia and Indonesia which made up a considerable part of the financial assistance these countries received.[30]

[27] Note other committed nations may also join this group to vote on certain issues.

[28] Bulganin (1955).

[29] Khrushchov (1955).

[30] Department of State Publications 6632 (1958): 23.

Generally, the Southeast Asian countries have managed to steer a course on most issues which follows the neutralism of India. The recent swing towards military dictatorships and the decline of democratic institutions in Southeast Asia, however, points to the need for a reappraisal of Western policy. Western policy has failed in Southeast Asia because it has two fatal misconceptions governed by the conditions of the cold war. Firstly that much of the political, economic and social instability in the area stemmed from Communist subversion and could be stopped by military policies of containment. This is a superficial assessment. It has been the point of this whole article to emphasise that this instability stems primarily from the phase of nation state-building and the introduction of new institutions. Such instability is only to be expected—in fact it is part and parcel of the creation of nation states. Secondly, until the early 1950s, the West failed to realise the need for financial and technical aid, principally because of its desire to stabilise Western Europe. Thus between 1 July 1945 and 31 December 1957 Western Europe received $24.9 billion in U.S. economic aid while the whole of Asia and the Pacific received $8.4 billion (of which $5.4 billion went to Taiwan, South Korea and Japan).[31] Consequently only a small percentage of the United States foreign aid has gone to Southeast Asia. The fact that many of the Southeast Asian countries refused extensive loans from U.S.A. was also an important factor. But even the aid that did arrive was frequently misused because there had been no reform of the countries' social and economic structure to accommodate it.[32] Western policy towards Southeast Asia has therefore not greatly relieved social and political instability.

Today, the emergence of nation states in the non-Western world gives a form of political organisation which can utilise the advanced technology of the Second Industrial Revolution to overcome the problems of poverty, social backwardness and economic underdevelopment which have persisted in these regions for so long. While the Soviet bloc's policy of financial and technical aid to help the economic and social development of the state does not involve any overt attempts to change the institutional structure of the state, the policy of the West seems still largely concerned with attempting to prop up political institutions which resemble its own. Such a policy reveals an arrogant belief in the supremacy of Western-style institutions, as well as a complete misunderstanding of the Southeast Asian situation. Containment, the attempt to freeze existing political institutions for the sake of

[31] *New York Times*, 7th December, 1958: 5.

[32] "According to a report in the *Wall Street Journal* of 8th September, total United States military and economic aid to Laos over the last five years has amounted to $225 million, but a large part of the military equipment thus supplied has 'rotted into uselessness' through mishandling and neglect." *Monthly Review*, October 1959, 184.

political stability, and a trickle of foreign aid are only stopgap measures provoked by the conditions of cold-war diplomacy. It is indeed only through social and economic change on a massive scale, through modernisation of outmoded economic and social systems and by (often unsuccessful) experimentation with new forms of political organisation that stability will ultimately be reached. The phase of nation-building is the inevitable end-product of the Western impact and the desire of Southeast Asian societies to assert their independence in the World Community and, above all, to shape their own destiny. The West would do well to realise the characteristics of such a period of political instability and adapt its policy accordingly.

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The Nature of Shifting Cultivation

A Review of Recent Research

R. F. WATTERS

IN recent years the steadily mounting spiral of world population and consequent shrinkage of per capita living space has compelled man to reassess the inherent qualities of the world habitat and to examine critically its potentialities for development in the light of existing economic systems and levels of technology. In particular, the environments and the economies of the humid tropics have come under close scrutiny, for this region, comprising forty-four per cent of the world's land area but containing only twenty-one per cent of its population, is often regarded as being one of the last remaining "empty lands" of the globe.[1] An impartial consideration of population densities and of widespread poverty provides ample justification for attempts at large-scale development of the "ecological problem areas" which make up so much of this region in an attempt to increase the productivity of its agriculture. It is significant that the pattern of population distribution within the humid tropics is markedly uneven and that the inhabitants are supported by the cultivation of a very small proportion of the total area. Thus in the Belgian Congo only one per cent of the area is cultivated, and the agricultural density[1] is 400 per square kilometre. In Brazil the figures are two per cent and 250 per square kilometre, while even in India only thirty per cent is cultivated with an agricultural density of over 360.[2] A large part of the area that is cultivated, however, is utilised under various forms of shifting cultivation—an agricultural system, mainly at subsistence level, that is characterised by impermanent use of the land.[3] In 1957, the area under shifting cultivation was estimated at 14,000,000 square miles—an area inhabited by some 200 million people at an average density of only fourteen to the square mile.[4] Largely as a result of the low carrying capacity of most forms of shifting cultivation, and the deleterious effects to the environment that accrue when this capacity is exceeded, officers of the F.A.O. have appealed for co-ordination among research specialists and field workers in renewed attempts to

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[1] That is, the total number of inhabitants, urban and rural, reported for the cultivated area.

[2] Gourou (1956): 337.

[3] A fuller definition is given below.

[4] F.A.O. Staff (1957): 9.

overcome the problems associated with shifting cultivation. They assert that shifting cultivation in the humid tropics is

" . . . the greatest obstacle not only to the immediate increase of agricultural production, but also to the conservation of the production potential for the future in the form of soils and forests."[5]

Stronger expressions of this view condemn the system as being wasteful or illegal, judging it to be not only a backward type of agricultural practice but symptomatic of a backward type of culture in general.

Such a view is widely held amongst agronomists and forestry officers who are concerned largely with environmental aspects of shifting cultivation. An opposing view is held by many social scientists who see man and his way of life as the prime factor in the situation and conceive of agricultural systems largely in terms of the cultures which they exemplify. This view may be represented by Carl Sauer who has upbraided the modern industrial West for its insensitiveness to other ways and values:

"We present and represent to the world a blueprint of what works well with us at the moment, heedless that we may be destroying wise and durable native systems of living with the land."[6]

With some qualifications, Sauer finds shifting cultivation, "in its basic procedure and crop assemblages", to be

" . . . most conservative of fertility at high levels of yield; that, being protective and intensive, we might consider it as being fully suited to the physical and cultural conditions of the areas where it exists."[7]

Such conflicting interpretations of shifting cultivation prompt this fresh survey, which is based largely on a review of recent work and in part on field work in Samoa and Fiji. Most forms of shifting cultivation have distinctive local characteristics, though basic uniformities are evident from several recent field investigations, and this encourages an attempt to ascertain the real facts that lie behind the system as a whole. At the same time suggestions will be made as to directions in which research could profitably be made. In view of the wide scope of the paper generalisations have to be made; it is inevitable that some of them will not apply to some forms of shifting cultivation.

CONCEPTS

What concept is most fruitful to understand the essential nature of shifting cultivation? The subject needs a methodology of its own appropriate to its elements and their patterns of relationship. Primarily it must be one which recognises that any system of agriculture stands in

[5] F.A.O. (1957): 9.
[6] Sauer (1956): 68.
[7] Sauer (1956): 57.

direct relationship to environing nature on the one hand, and to the culture of the occupants on the other. No interpretation will be adequate if it fails to give due weight to both the organic and supraorganic factors that form the interrelated complex of features that characterises agriculture in visible form on the land. In considering advanced agricultural systems in which the cultural (including economic) factors may not be much influenced by those of the local environment this view resolves itself to some extent into a dichotomy. In shifting cultivation, however, man's "margin of freedom" from the coercive circumstances of the environment is less great, and he is usually best regarded as being a part of nature rather than apart from it. Indeed, it is true to say that the patterns of life of most groups of shifting cultivators are more readily understood if they are seen in their environmental context. As de Schlippe has said, " . . . the teacher of a culture is its environment and agriculture is its classroom".[8]

Within this preliminary frame of reference, a survey of the concepts employed in the literature on shifting cultivation reveals two approaches that are particularly illuminating—those of Pierre de Schlippe in his *Shifting Cultivation in Africa,* and of Harold C. Conklin in *Hanunóo Agriculture*. De Schlippe sees the agricultural system of an ethnographic unit as

" . . . the customary pattern of behaviour followed by the individual members of the unit in the realm of agricultural technology which results in typical sets of:
(1) Land utilization in space (pattern of field types in their respective ecological backgrounds);
(2) Land utilization in time (pseudorotations);
(3) Seasonal distribution of labour;
(4) Seasonal distribution of nutrition and other needs."[9]

While the qualities of the environment are dominant in his approach, de Schlippe sees traditional agriculture as the "most important part of", and indeed "almost synomonous with, the culture as a whole in its function of ensuring the survival of the group in its habitat".[10] The emphasis of Conklin (an anthropologist) is less on the environment, and more on the cultural context in which the economy of the society has evolved. In taking an "ethnoecological" approach[11] he emphasises

" . . . not only the local environmental conditions and their apparent modifications, but especially the determination of how these conditions and modifications are culturally interpreted."[12]

[8] de Schlippe (1956): xii.
[9] de Schlippe (1956): 238.
[10] de Schlippe (1956): 241.
[11] Conklin (1957).
[12] Conklin (1954): 133.

It is abundantly clear from these masterly works that a structural approach sheds much light on the range of environmental and cultural elements involved in this agricultural system. In itself, however, this would lead to a static view. Study of the operation of any form of shifting cultivation over a period of time throws light on the functional role of the various elements in the whole system and the degree of integration that exists among them. Thus such elements as soil and vegetation types, climatic season, traditional practice and economic orientation all have a character of their own (which is seldom static) which influences the total pattern at each stage of cultivation, while at the same time they are orchestrated together in the whole ecosystem to produce distinctive cadences of activity.

This ecological approach which stresses both structure and function provides us with an illuminating working hypothesis by means of which the innumerable features of shifting cultivation can be ordered in a manner that appears to correspond to their associations in reality. It facilitates study of shifting cultivation both as an agricultural system in the landscape, and as that level or dimension of culture most closely related to the environment.[13] While it is essentially holistic in its inclusion of all aspects of the system, it does not prevent preferential consideration of a narrow range of factors which may produce deleterious effects on the environment and economy and thus create a critical situation in which shifting cultivation can no longer operate efficiently.

There is one limitation of this approach, however, that must be guarded against: cultures of shifting cultivators vary widely in their degree of adaptation to the environment. Not all sectors of culture are connected with adaptation for survival, and culture as a whole has a fair measure of autonomy. As Robert Redfield has noted, "human mental life has a structure of its own" and many aspects of culture, including some agricultural features, may be difficult to describe purely in terms of their "connections with the land and the rain and the trees".[14] On the whole, however, when studying societies at subsistence level, the ecological approach holds good since food production generally consists of " . . . an uninterrupted and interlocked chain of functions from the first clearing of a field to the actual cooking process".[15] In short, the ecological framework is particularly valuable if used with care and rearranged or modified to fit the facts of each distinctive environment and culture and the resulting character of agriculture in the "contact zone" in between.

[13] Watters (1958).
[14] Redfield (1955): 31.
[15] de Schlippe (1956): 89–90.

Photo: R. F. Watters

Fig. 1. Clearing climax forest—the first stage of the cycle. Koro Island, Fiji.

Photo: R. F. Watters

Fig. 2. Burning degraded second growth bush prior to planting—the second stage of the cycle. In the background is mission grass (*Pennisetum polystachyon*) a fire-induced climax. Nalotawa, Viti Levu, Fiji.

WHAT IS SHIFTING CULTIVATION?

Of the many definitions of shifting cultivation, that of Pelzer in 1958 is possibly the most meaningful, for it not only elucidates some of its most distinctive characteristics as an agricultural system but at the same time seems to cover all its variant forms. A slight modification to include some reference to technology appears to be desirable: *Shifting field agriculture is characterised by a rotation of fields rather than of crops, by short periods of cropping (one to three years) alternating with long fallow periods (up to twenty years or more, but often as short as six to eight years), by clearing by means of slash and burn, and by use of the hoe or digging-stick, the plough only rarely being employed.*[16] Forms with short fallow periods fall within this definition, although it is useful to follow Faulkner and Mackie in distinguishing as "rotational bush fallow" those which have fallow periods of not more than six to eight years.[17] Such a distinction facilitates understanding of the special needs of this type, in which relatively high densities of population often denote a degeneration of the natural vegetation and decline in soil fertility.

Such a system of agriculture has varying appearances in the landscape. In a forested area the landscape frequently has a pock-marked appearance (Fig. 1) with agricultural clearings (termed "swiddens"[18]) appearing haphazardly here and there amid the dominant green of the vegetation, or perhaps spreading outward in bubble-like patterns from the compounds of a settlement. In between the swiddens, brushy thickets of varying height and density (termed *belukar* in Indonesia[19]) indicate former fields or gardens now regenerating.

Contrasts between any two groups are readily discernible in such features as the size or shape of clearings, crop assemblages, and methods of cultivation. Fuller cross-cultural study of forms of shifting cultivation reveals many differences but some similarities in basic characteristics. Differentiation of these societies can be done in several different ways, each useful for specific purposes.

[16] Pelzer (1958): 126. This is a slightly refined version of that of Pelzer (1945): 17. Another useful definition is that of Buchanan and Pugh (1955): 103.

[17] Faulkner and Mackie (1933): 44. Morgan (1957): 4, and (1959): 138–150, and Watters (in press) also make this distinction.

[18] Conklin (1954) and (1957) has followed Izikowitz (1951): 7, in using the term "swidden", the English dialect word for burned clearing. His reason is that it "lacks regionally linked specific associations" (p. 1). Pelzer (1958): 127, also accepts the term in preference to local names or such descriptive terms as "shifting field", "slash-and-burn clearing". For these reasons the term will be used here. For an etymological discussion of the word, see Eckwall (1955): 135–136.

[19] van Beukering (1947): 248.

TOWARDS A CLASSIFICATION

Classification must be based, primarily, on differences in economy in respect to sources of food production. The following major types may be distinguished:

(1) Predominantly hunters and gatherers, but practising shifting cultivation to a small extent.

(2) Depending mainly on shifting cultivation, although indulging in some hunting, fishing or gathering.

(3) Depending almost entirely on shifting cultivation, with almost no other source of food production.

(4) Predominantly pastoralists, but also practising some shifting cultivation.

(5) Depending mainly on shifting cultivation with some pastoralism.

(6) Depending mainly on shifting cultivation but with some permanent form of cultivation.

(7) Some shifting cultivation, some permanent cultivation and also some pastoralism.

(8) Depending mainly on some permanent form of agriculture with some shifting cultivation.

Many examples of each type occur in tropical Africa, Southeast Asia and Central America. Thus the food gathering Veddahs of Ceylon, who replace a portion of plant stock when gathering, represent a backward form of Type 1.[20] The Boro people on the Japura River in the western Amazon forest are an example of a group based on the cultivation of cassava in shifting clearings supplemented by hunting.[21] Of societies that depend almost completely on shifting cultivation, the Hanunóo of Mindoro Island in the Philippines are an example that has received thorough study.[22] The Munda people of Bengal may be taken as an example of pastoralists who also practise some shifting cultivation of millets and a little rice.[23] The fifth type may be illustrated by the Palaung people of Burma, who depend mainly on the shifting cultivation of rice (and in addition plant tea), although they also keep cattle.[24] The tuber-oriented peoples of Melanesia and Polynesia may be taken as illustrations of Type 6, for in addition to shifting gardens they also have permanent groves of tree crops and semi-permanent plots near the village. Other examples occur in many parts of Indonesia, where

[20] Bews (1933): 186. The Ainu of Hokkaido, Japan, are an often quoted example from outside the humid tropics who also appear to have been emerging from the hunting stage to that of agriculture.

[21] Daryll Forde (1934): 131–147, based on T. Whiffen, *The North-west Amazons*, London, 1915.

[22] Conklin (1957).

[23] Terra (1953): 444.

[24] Terra (1953): 444.

wet rice cultivation and perhaps mixed gardens containing a variety of tree and ground crops supplement the shifting cultivation of dry rice, while in Africa many examples can be found of shifting cultivators who have practically permanent subsidiary gardens near their settlements. In areas that experience a lengthy dry season (as in parts of eastern Indonesia) pastoralism is often important, and where some land is available for irrigated rice, a broader economic base supplements (and in favourable areas may supplant) shifting cultivation (Type 7). These forms are frequently similar to the former infield-outfield systems of the Celtic uplands, with the infield kept in permanent cultivation by the use of the manure of animals kept near the houses. Type 8 is found on soils that are perpetually refertilised by alluvial deposits or which can be readily irrigated enabling permanent cultivation (mainly of wet rice in Southeast Asia) for the main source of food, with supplementary supplies coming from shifting swiddens on the less fertile hills (e.g., the Sakai of Malaya).

A merit of this classification is that it throws light on possible courses of cultural evolution. Thus the first three types may possibly stand in some evolutionary relationship to one another; and so perhaps do 4, 5, 6 and 7. In the upper Orinoco Basin of Brazil, for example, a cultural sequence may possibly exist between the hunting and gathering Guaharibos who plant only bananas and the nearby Maquiritares who have a fully developed form of shifting cultivation.[25] Generalisations on cultural evolution, whether based on unilinear or multilinear theory, are dangerous, however, at our present state of knowledge, as they depend essentially on cross-cultural (and cross-environmental) comparisons of selected cultural traits taken out of their ecological contexts. Many agricultural systems that appear to form evolutionary sequences may be explained when more is known about diffusion patterns and the factors that determine the acceptance of immigrant culture traits.

An interesting classification by Conklin[26] bears some relation to the above approach, but is much more concerned with the degree to which shifting cultivation is integrated with other forms of agriculture in any given "sociocultural matrix". The term "partial systems" is used to describe those in which cash cropping, or other form of commercial agriculture, occurs with shifting cultivation. A further subdivision is made into the "supplementary" sub-type, where a predominantly permanent field cultivator has some swiddens, and the "incipient" sub-type, which refers to the beginnings of full-time shifting cultivation by a settler moving into an upland area, usually from an overpopulated permanent-field area. In contrast to partial systems, "integral" ones are defined as stemming from a "more traditional, year-round, com-

[25] Gheerbrant (1953): 224.
[26] Conklin (1957): 2–3.

munity wide, largely self-contained and ritually sanctioned way of life". These have two sub-types: "pioneer" shifting cultivation, where significant areas of climax vegetation are usually cleared annually, and "established" shifting cultivation, in which tree crops are plentiful and practically no climax vegetation is cleared each year.

The merit of Conklin's approach lies in its recognition of the frequent association and integration of diverse forms of agricultural production. For further refinements of classification, Conklin suggests the use of ten criteria: principal crops, crop associations and successions, crop-fallow time ratio, dispersal of clearings, use of livestock, tools and techniques, treatment of soil, vegetation cover of land cleared, climatic conditions, and soil conditions.[27] To these inter-dependent variables two more may be added: the density of population on cultivable land, and the type of settlement pattern.[28] Although these are to some extent dependent upon some of Conklin's variables, their fundamental importance in affecting the total occupance pattern and long-term land usage is such that they merit separate consideration.

This classification does not, however, emphasise the most distinctive and significant feature of shifting cultivation—its shifting character. In view of the relatively low densities of population that this extensive system can permanently support in any region, a classification which makes meaningful distinctions in terms of patterns of land rotation will be of considerable practical value. The significant differentiation here is between those societies whose settlements shift as well as their fields, and those whose settlements are fixed. This distinction follows in part the approach of Waibel in contrast to that of Pelzer[29], who argues that the agricultural system may be essentially the same in each case. In adopting a wider view, full recognition is given to the man-land relationship throughout the whole territory ranged by the cultivator. At the same time, permanency of settlement often marks a rather higher cultural level at which a firm basis exists for elaboration of culture. It also marks a type of relationship with the environment that is perhaps nearer to permanent cultivation.

Of those societies who shift their settlements as well as their fields, a useful distinction can be made between long and short cycle migration. While there is on the whole a paucity of detailed information on ethnoecological conditions of cycle migration, it is clear that the shifting of settlements as well as fields denotes the operation of two cycles of

[27] Conklin (1957): 2.

[28] Watters (in press).

[29] Waibel, L., "Die Europäische Kolonisation Südbrasiliens", *Colloquium Geographicum*, 4, Bonn, 1955, cited in Pelzer (1959): 127. In addition to Waibel, Morgan (1957) proposes the restoration of the term shifting cultivation to groups with nomadic settlement as well as cultivation.

soil degradation of two distinct durations.[30] In the shorter cycle, declining yields or increasing weeds compel the cultivator to shift his fields. Rotation of all cultivable land within reasonable walking distance of the settlement is not sufficient, however, at existing levels of technique to prevent loss of soil fertility, compelling migration of the whole community to a new area that is fully restored. De Schlippe has referred to the pressure of a niggardly environment as the "force majeure" which governs these movements, interposing a serious obstacle in the way of progress.

Short cycle migration is practised by the Lala, on the overpopulated and generally infertile Serenje plateau of Northern Rhodesia, who move an average distance of five miles once every 5.5 years.[31] In the Equatoria Province of the Sudan, the Azande also practised a short cycle migration, moving perhaps as often as five times in fifty years.[32] The periodic dying of their homesteads corresponds to a rhythm of which the people are not entirely conscious, for they move in response to repeated misfortunes of a social nature as much as to such tell-tale signs as repeated crop failures. The importance of cultural as well as physical factors has been argued by Izikowitz with regard to the Lamet of Laos in view of the fact that their settlements seldom reach their maximum size.[33] The influence of the environment appears in many societies to be translated into the body of culture and re-expressed in muted form in the institutional conditions of society, appearing perhaps in the form of sorcery and in various expressions of social tension.

A vivid description of long cycle migration has been provided by Ursula Bower,[34] who lived with the Zemi people, a sub-tribe of the Nagas of Assam. This people lived in extremely steep forested country, in which land suitable for *jhuming* was widely dispersed on slopes on which cultivation was for the most part physically impossible or quite uneconomic. In this instance, the evolution of cycle migration appears to be explained by the nature of the terrain together with the intense rivalry for land that existed between warring sub-tribes, rather than by the absence of effective methods of population control. The Zemi followed a cycle of over two hundred years' duration, consisting of a progression around acknowledged sites. With the coming of the Pax Britannica, immigrant peoples settled on Zemi long-term fallow land. The tracts of land claimed by the Zemi seemed to the Government to

[30] de Schlippe (1956): 213.
[31] Peters (1950): 51.
[32] de Schlippe (1956): 192.
[33] Izikowitz (1951): 361; Izikowitz's method may be questioned, however, as in working out the area needed to support a village of 150 people he counts all land as potentially cultivable.
[34] Bower (1952): 135–141.

be grossly excessive and all land that they were not currently occupying was awarded to another sub-tribe. The economic and environmental consequences of administrative ignorance have been catastrophic: progressive over-cultivation, forest recession, accelerated erosion, fusion of settlements in a vain search for space, chronic food shortage, and consequent boundary troubles and social and political tension.[35]

THE PHASES OF SHIFTING CULTIVATION

A classification of the varying types can concern itself merely with differences in major features. While this extensive approach sheds light on some basic features, a more intensive ethnoecological approach must supplement it. The structure and function of the innumerable elements in any system are more clearly seen in a study of the yearly round of agricultural activities. These fall into six distinct phases—choosing the site, clearing the land, burning, planting, cultivation and harvesting. While a very broad range of variation occurs in the patterns of activity at each phase, some basic or very common features are apparent in most of these phases.

Selection of Sites

The cycle of cultivation in any community commences with the selection of sites for the swiddens. Considerations determining the site commonly express local evaluations of the soil requirements of the crops to be planted. Many societies have evolved a rudimentary classification of soil types, arising from their collective experience over centuries. Classification is generally based on the recognition of certain trees and grasses as indicators of soil type, or on variations in the colour and texture of soils.

In studying the Bemba people of Northern Rhodesia, Audrey Richards found soil selection practised only by the old or more efficient cultivators, whose knowledge was acquired through experience. The process was described to her "as learning how to understand the things of the soil or the trees of the bush". The Bemba method of land selection, however, still left a wide margin for possible failure, and the regular testing of the soil by trial and error was part of their traditional practice.[36] The threat of failure also haunts the Hanunóo of the Philip-

[35] When the administration realised the nature of the situation it launched a campaign for the introduction of permanent agriculture in the form of wet rice terracing. Unfortunately this failed due to a change in Deputy Commissioners, inefficient demonstration resulting in broken irrigation channels and consequent loss of crops, and the potency of local superstition, which held that the use of water in one's fields caused death by dropsy. As a result, soil destruction and acute poverty continued unabated, with the opportunity of wage labour on the fields of neighbouring tribes offering no real solution.

[36] Richards (1939): 287, 283.

pines, in spite of their intimate knowledge of local forms of vegetation and their much more bountiful environment and broader economic base. Thus local augury, dreams and omens play an important part in supplementing local knowledge of the environment.[37]

If primary forest is available, it seems generally to be chosen in preference to secondary forest on account of its deeper humus and greater soil fertility. However, secondary forest is preferred by some groups who find primary forest difficult to clear. A shortage of manpower for clearing may also lead to choice of second growth bush. Felled primary forest also requires a longer drying period before burning can commence, if a relatively complete burn is desired. Some groups in Sarawak regularly fell a proportion of old growth as well as new canopy forest.[38] However, in most areas today little or no virgin vegetation is available, and various forms of rotation exist, with choice of site generally falling on land where the structure of vegetation indicates the longest fallow period. Thus, in Samoa, land would not be reused until the branches were "as thick as a man's arm".[39] Migrant cultivators frequently choose former village sites, where accumulated refuse and remnants of thatch give superior fertility.

Economic factors are significant in affecting the radius of agricultural operations. Frequently choice is made of a site close to the village in preference to a superior one several miles distant. However, the necessity to use the best land available is very common, and this often leads to subsidiary or temporary houses being built on distant fields to avoid travelling. Social factors can also play a part, where the cultivator prefers to cut his clearing in an area near other members of his kinship group. Tribal authority also may be exerted in the matter of choice with chiefs often having first preference[40] or even sometimes directing a general distribution.

Clearing

The selection having been made, clearing follows, usually at the beginning of the dry season. Although some people burn first if the vegetation is inflammable, it is more common to clear first and leave the debris to dry for a month or two prior to burning. If the region is not forested, cutting of grass tops and scrub is generally done much later in the dry season and then followed immediately by burning. Large trees are often killed first by ring-barking or firing at the base and then smaller trees and undergrowth slashed. Some groups completely clear the ground, others leave smaller trees intact to speed regeneration, while in some

[37] Conklin (1954): 135.
[38] Leach (1950): 89.
[39] Brown (1910): 339. See also Leach (1950): 90.
[40] Richards (1939): 267.

systems trees are merely pollarded. Commonly felling is done at waist height or just above the flaring buttresses. It appears that there may be some relation between the extent of clearing and the importance of wood ash as a fertiliser in the agricultural practice of the group in question.

The size of clearings varies considerably, depending largely on the overall limiting factor of population density. Within the context of population density, other factors are effective: the number of people to be fed from the one garden (the "garden family"[41]), the fertility of the soil, the ease of clearing, and the size and energy of the labour force. In partial systems which have other forms of food production or sources of cash income, the size of clearings is commonly smaller than with the true or integral shifting cultivator. In fertile parts of Samoa and Fiji, three or four plots of only one-tenth of an acre are often sufficient to provide a family's wants where there is a little cash cropping, while on the other hand two or three clearings totalling fifty acres may be needed in infertile areas or where the garden family considerably exceeds the natural family in size.

Burning

Burning is done generally late in the dry season when the cut timber is sufficiently dry to secure a good burn. Patterns of burning reflect differing adjustments to the land, varying from firings aimed primarily at the destruction of debris to provide space for planting as in some Oceanic forms, to the burning of carefully stacked circles of timber in the *Chitemene* forms, which ensure a concentrated distribution of fertilising ash and the use of soils that would otherwise be uncultivable. In these latter forms only about ten per cent of the area felled may be burnt and not all of the burnt area is planted. Felled timber is stacked in circles of varying size, depending on the amount of ash needed to secure a good crop. The percentage of border wastage varies considerably, reaching the very high average figure of about thirty per cent with the Lala of Northern Rhodesia.[42]

The success of the burn depends on the thoroughness of the cutting activities, the type of vegetation, and, in particular, the weather conditions. Thus, the Iban of Sarawak prays:

> "In health and happiness may we dwell in this land; and when we fire our farms may they fiercely burn; it is for a drought that we plead."[43]

Sometimes secondary and even tertiary burning is necessary in humid areas to destroy all debris, for crop yields bear a direct relation to the completeness of the burn in view of the destruction of insect pests, and in particular, the resulting increased availability of valuable plant

[41] Allan (1949): 7.
[42] Peters (1950): 37.
[43] Freeman (1955): 44.

nutrients in the upper soil horizons.[44] Moreover, a good burn will break up hard lateritic surfaces, and obviate some preliminary working of the soil.[45] As the Iban says: "If the farm be completely burnt, then the padi wants to grow."[46]

Man's relation to the land is indeed mirrored in his use of the torch as an agricultural tool. Where firebreaks are cut and rigid precautions are taken against spreading of the fire, a traditional sense of conservation is evident.[47] Magico-religious beliefs also often buttress traditional techniques. In many instances, the shifting cultivator has, however, been condemned for the transformation of forest land into sterile grassland. It is true that some societies in thinly settled regions are particularly prodigal or careless in their use of land resources; thus the Iban of Sarawak have been described as "mangeurs de bois". Almost limitless tracts of primeval rain forest in the Rejang basin have induced the Iban to regard it as an expendable resource since they conquered the region over a century ago.[48]

Planting

The penetration of religious beliefs into agricultural practice is particularly evident at planting times, when use is made of supplicatory rites to guardian spirits, or propitiatory offerings to evil ones. In areas where rainfall is seasonal, planting is timed to take full advantage of the rains. In the planting patterns that follow the ingenuity of the shifting cultivator is most strikingly displayed.[49] In most areas he has learnt to simulate the conditions of the forest cover, by planting an association of crops that grow in tiers of varying height and structure to intercept the falling rain, cover the ground and take advantage of different light conditions.[50] Root systems of annuals are commonly well developed to tap available nutrients before they are leached away. The result is an apparent disorder, for the cultivator "embroiders his agricultural activity on a canvas and pattern provided for him by nature".[51] To the European's conceptions of geometrically patterned fields and

[44] Joachim and Kandiah (1948): 3–11; Frith (1955): 183; Watters (1958): 347. The effects of burning lie outside the scope of this paper.

[45] Whittlesey (1937): 44.

[46] Freeman (1955): 44.

[47] Conklin (1957): 64–67.

[48] Freeman (1955): 26, 117–118.

[49] Acculturation has often destroyed the purpose behind the practice, and led to views that regard the practice as meaningless or inferior, yet still the practice often remains, buttressed by some traditional ideas. "Yes, those plants are pressing against each other. Each will steal the food of the other. But are we to throw them away? Would not that be a slight to the spirits? Is it not they who gave us the food?" Richards (1939): 307. The writer has commonly noted similar instances in Fijian practices.

[50] Sauer (1956): 57.

[51] de Schlippe (1956): 107.

Photo: R. F. Watters

Fig. 3. Intercropping of taro and yams. Small trees have been left to support the yam vines and speed regeneration. Nalotawa, Viti Levu, Fiji.

sense of order (the natural legacy of living in the most transformed landscape of all) the ragged bush line that marks the boundary of the clearing and the confusion of crops lying within it seem to be based on no rationale at all. De Schlippe has ably demonstrated the nature of this rationale—the "hidden order" that gives meaning to the seeming chaos.

The long-continued process of trial and error—of constant improvisation forced on the cultivator by the many circumstances, physical and human, which defeat his plans—has led to the establishment of crop associations in which many crops flourish each in their respective ecological niches, and some indeed could not live apart from it. Slow-growing plants that could not compete with weeds thus find a place

and are integrated into the assemblage. The advantages of growing crops in associations are obvious: it leads to a very high yield per unit area, provides some sort of "insurance value" against failure of individual crops, and ensures food production at various times throughout the year. Out of the immense number of crops that are theoretically possible in the various soil-vegetation types, each region seems to have evolved only a small number of associations adapted to local ecological conditions.

The planting and tending of the "new vegetation" of the clearing is a complex process in forms that have a large crop assemblage. Crops are planted and cultivated simultaneously, or in overlapping fashion, producing in some systems a "constantly changing mosaic of intercropped cultigens".[52] In fact crop successions often form a kind of limited crop rotation, for some crops are particularly suited to the second or third years of cropping. A useful concept for understanding the complexity of planted clearings has been formulated by de Schlippe, who classifies all fields or gardens into a certain number of "field types". A field type

> "consists of a combination of a certain number of crops either in the form of an association, with simultaneous or successive sowing dates, or in the form of a succession (within the same season), or of both association and succession. It consists further of certain specific ecological backgrounds, and in the third place it consists of a certain combination of methods of management arranged according to a definite timing."[53]

The cropping patterns of the Azande in the extreme south of the Equatoria Province of the Sudan, are then classed into seven main field types, each in effect being "special environments for specialized crops".

> "These environments are created partly by the right choice of the ecological formation, but also by the intentional use of opening methods [clearing, burning and preliminary cultivation] suitable for the crops. The part played by intention is small; that played by circumstance is great. But still, the intention is present and it implies an attempt to overcome the coercive circumstances of nature.[54]

Such a structural arrangement of the elements as de Schlippe has done in his "field types" illustrates the manner in which shifting cultivation is adapted to tropical conditions. Thus Morgan's interpretation of the nature of shifting cultivation[55] is vindicated; adaptation occurs particularly in the choice of crops to be grown, in their associations and successions, and in the agricultural practices required to tend them.

The common belief that shifting cultivation marks a backward level of agriculture and a most inadequate form of subsistence has been re-

[52] Conklin (1957): 72. A cultigen is a crop that is planted by means of placing a portion of the plant (sprout, cutting, root stock) in the ground.
[53] de Schlippe (1956): 117.
[54] de Schlippe (1956): 135 (brackets mine).
[55] Morgan (1957).

futed by Conklin's study of the Hanunóo. These people have up to forty separate crops growing in one swidden at the same time. An "ideal" swidden contained forty-eight basic kinds of plants (or over 250 specific types) including forty-one cultigen food plants and six non-food cultigens.[56] At the same time it is true that many societies do depend on a narrow range of crops, sometimes grown in almost single-crop swiddens. The most outstanding example of what is virtually single cropping is surely that of rice, found in the types of many peoples of upland Southeast Asia and in Sierra Leone and other parts of West Africa.[57] Rice-oriented societies display many differences from other groups of shifting cultivators which appear to be due to the processes of diffusion rather than the working out of any particular local form of adjustment to the environment. The greater food value of rice per unit area in comparison with any other crop is a fact that helps to explain its agricultural dominance and cultural importance and the consequent exclusion of "field types" based on other crops.

Cultivation

Methods of cultivation in the main attempt to preserve the ecological equilibrium of crop associations. Much working of the ground is generally not required as latosols are usually friable in nature, and particularly so after burning. Too much working or ploughing, moreover, may increase the erosion hazard. In many parts of Tropical Africa, mounds and ridges are thrown up to form micro-environments specially suited to the needs of particular crops. Regular weedings and an occasional slashing of vigorous pioneers are necessary until the associations are sufficiently advanced. In areas that experience a dry season, weeds are often left as mulch to conserve moisture and protect the ground.

After a period of cultivation varying from one to two or three years, the benefits accruing from the burn are long since finished and the humus of the former forest floor is seriously depleted. Declining yields then compel the cultivator to abandon the field for a lengthy fallow period. Increase in weeds is also a powerful factor inducing abandonment, being in some areas (e.g., Ceylon) apparently more effective than declining fertility.[58] After the last harvest the swidden is usually completely abandoned, although some societies plant tree crops (e.g., coconuts or bananas in parts of Fiji)[59] which partly determine the vegetative cover during the fallow period. Such a trend brings the cultivator to the transition stage between shifting and permanent cultivation.

[56] Conklin (1954): 138–139; see also Conklin (1957): 72–98.

[57] Paulme (1954); Lewis (1954): 80–94.

[58] Joachim and Kandiah (1948).

[59] Fruit trees and coconuts are planted in Pahang state, Malaya; "Padi Planting Methods in Malaya" (1939): 58. In some forms some ground crops such as cassava are sometimes also left to grow in the regenerating bush.

Photo: Keith Buchan

Fig. 4. Swidden in dry forest, Abeokuta Province, Western Region of Nigeria. Maize recently cleared; cassava, pawpaw and mixed vegetables forming discontinuous cover. Stumps left to provide a basis for regeneration.

Photo: Keith Buchan

Fig. 5. Ridge cultivation of cassava, Colony Province, Nigeria. Frequent burning and clearing in a heavily populated area has resulted in replacement of climax high forest by palm groves or savannah grasslands.

THE INFLUENCE OF THE ENVIRONMENT

In 1957 Pierre Gourou posed this question to geographers attending the I.G.U. Conference in Japan:

> "Should 'ladang' be considered as linked in a certain measure to tropical conditions? Or is it simply a technological level destined to disappear in the progress of civilizations?"[60]

While Gourou earlier stressed the fact that shifting cultivation is "well adapted to natural conditions", and shows "great understanding of the condition of tropical soils",[61] his interpretation is far from being a naive determinism. In support of the view that shifting cultivation is essentially a product of tropical conditions various authorities have quoted the experience of numerous technologically advanced colonists who have settled on "stable" (see p. 80) or unirrigated soils in the tropics. Finding their intensive methods unsuited to the conditions, they have adopted shifting cultivation. Thus we may cite the well-known example described by Waibel of European immigrants in Brazil adopting the shifting field methods of the local Indians,[62] and Pelzer's reference to immigrant Javanese settlers in the Sukadana colonisation project in South Sumatra who abandoned the traditional sawah culture to which they were accustomed.[63] The nature of environmental influence as an overall determining factor can only be gauged, however, by regarding the environment not merely as the sum of its component elements but as the sum of the relationships that exist within it. It is necessary to examine these elements and relationships therefore before considering the "secondary environment" of cultural level, technology and population density, and the significance of each in the total ecosystem.

Climatic Conditions

The essence of the environmentalist's view is that shifting cultivation is a purely tropical phenomenon. There are many well known instances, however, of shifting cultivation being practised in temperate lands, some forms of which still survive to the present day. Examples come from northwest Spain,[64] the Black Forest and other isolated parts of the Hercynian highlands of Germany and Central Europe,[65] and parts of the uplands of Japan,[66] China,[67] and Korea.[68] The survival of these forms since the Neolithic period has been explained by Demangeon as

[60] Gourou (1959): 578.
[61] Gourou (1953): 31.
[62] Waibel (1955) cited in Pelzer (1958): 126.
[63] Pelzer (1958): 126.
[64] van Beukering (1947).
[65] Pfeifer (1956): 252; Pelzer (1958): 127; Darby (1956): 200, 208.
[66] Gourou (1953): 32; Soma (1959): 470–477.
[67] Food and Agricultural Organisation of the United States (1948).
[68] Gourou (1953): 32.

due to the inferior techniques of production and to the low density of population..[69] However, the densities of population in areas of shifting cultivation in Japan and Korea are not always low, and technological backwardness and peasant poverty alone do not appear to be an adequate explanation. On the other hand, Gourou's thesis that the temporary cultivation of burnt outfield land in the temperate belt is a response to the environment similar to that occurring in the tropics, and can only be explained by the poverty of soils and the general steepness of the slopes, appears to be largely borne out. Tropical soils as a whole "evince features that are exceptional in the temperate belt"[70] However, as Pelzer has pointed out, shifting cultivation in Europe survives mainly as an agricultural activity supplementary to some form of permanent agriculture. Thus factors such as an inadequate labour force, extreme poverty and low level of nutrition, effects of chronic disease, and especially inferior technology, also appear to play some part and a rather wider interpretation than Gourou's appears to be desirable. The final answer, however, must await the accumulation of much more detailed and positive data for the comparative study of all these aspects of shifting cultivation in temperate regions.

The most distinctive features of tropical climates in comparison with temperate ones are higher temperatures and higher rainfall. These make for a higher level of plant nutrition, rapid leaching rates, and rapid ageing of the soil system which is expressed in one way by the swift decline in the nutrient supplying power of the soil on cultivation. Shifting cultivation is seen by Wright and Twyford as "one of the methods of the indigenous farmers to adapt to these conditions".[71]

It would seem then that in studying the climates of the humid tropics, attention should be directed at data concerned with leaching rates. Lysimeters actually record the amount of rainfall passing through a column of soil, but comparative data is scanty and of too short a duration. Thus methods have to be devised based on average monthly figures of rainfall, evaporation, transpiration, and runoff to determine the amount of percolation. Experience suggests that Thornthwaite's "potential evapotranspiration" formula is of doubtful validity in the tropics, as there is no assurance that the empirical relations derived from the data of middle latitudes will apply in the tropics.[72] A significant attempt to classify and map tropical soil climates has been made by

[69] Demangeon (1949): 179.

[70] Gourou (1953): 32. Recent pedological research has stressed the close similarity between podsolization and laterisation. Differences are more ones of degree rather than of basic type. See Carter and Pendleton (1956).

[71] Wright and Twyford (1957): 56.

[72] Mohr and van Baren (1954): 60–61; Blumenstock (1958): 7–8. The method of Penman (1940), (1948) and (1956) has not yet been fully tested in the tropics.

Mohr[73] who divided the whole intertropical zone into wet and arid tropics according to whether the rainfall under given conditions of temperature and evaporation produces a downward movement of water through the soil profile or not. The figure of 2.36 inches (60 mm) was the quantity of water considered by Mohr and van Baren[74] to be near the point where evaporation in the tropics accounts for most of the water loss from the soil and runoff and percolation becomes practically zero—i.e., a downward movement of water through the soil ceases and an upward movement commences. Numerous soil surveys have shown that the number of dry months (i.e., with less than 2.36 inches of rain) in any region has a direct bearing on the degree of leaching and thus on the nutrient status of soils (other factors being equal) and in consequence the likely period of cropping that they can sustain.[75] Thus in Fiji a classification by Wright and Twyford based on Mohr's method divides the group into six climatic regions according to the length of the dry season. This division is shown to be meaningful in the classification of soil types as zonal qualities are generally dominant. The writer's own field work in various areas of the wet and dry zone in Fiji confirmed this approach, as it would seem that the lower leaching rates are directly responsible for the longer cropping periods that occur in the dry zone (up to over five years at Nalotawa, Mba) in comparison with generally shorter periods in the strongly leached wet zone areas.

Soil Conditions

The nature of shifting cultivation can most readily be appreciated when the character of tropical soils is considered. While an immense range of types exists, depending on parent material, slope, age and organic matter, the zonal imprint is generally apparent. While true laterites are uncommon, the universal process of laterisation is everywhere going on and shifting cultivation is a response to the transient nature of nutrient supply in these characteristic latosols.

In general, only four classes of soils in the humid tropics are sufficiently fertile to support permanent agriculture without difficulty. These are soils occasionally rejuvenated by additions of volcanic ash; steepland or unstable soils where an effective "inorganic cycle"[76] is operating;

[73] Mohr (1933–38): 53–60.

[74] Mohr and van Baren (1954): 65.

[75] Other tropical climatic classifications that are significant for agriculture are those of F. H. Schmidt and J. H. A. Ferguson (*Verh. Meteor. Observ.*, 42, 1951) and W. van Bemmelen (Boerema, J., 1931, *Verh. Magn. Meteor. Observ. Weltevreden*, 23, 1931, p. 25). The former is an improved refinement of Mohr's method, while the latter adopts as a measure of the severity of the dry monsoon period the number of rainy days during the four driest consecutive months of the year. This method appears to be useful for understanding floristic patterns. See van Steenis (1958): 27–28.

[76] That is, leached and highly weathered material is continually moving downhill and fresh materials are brought closer to the root zone.

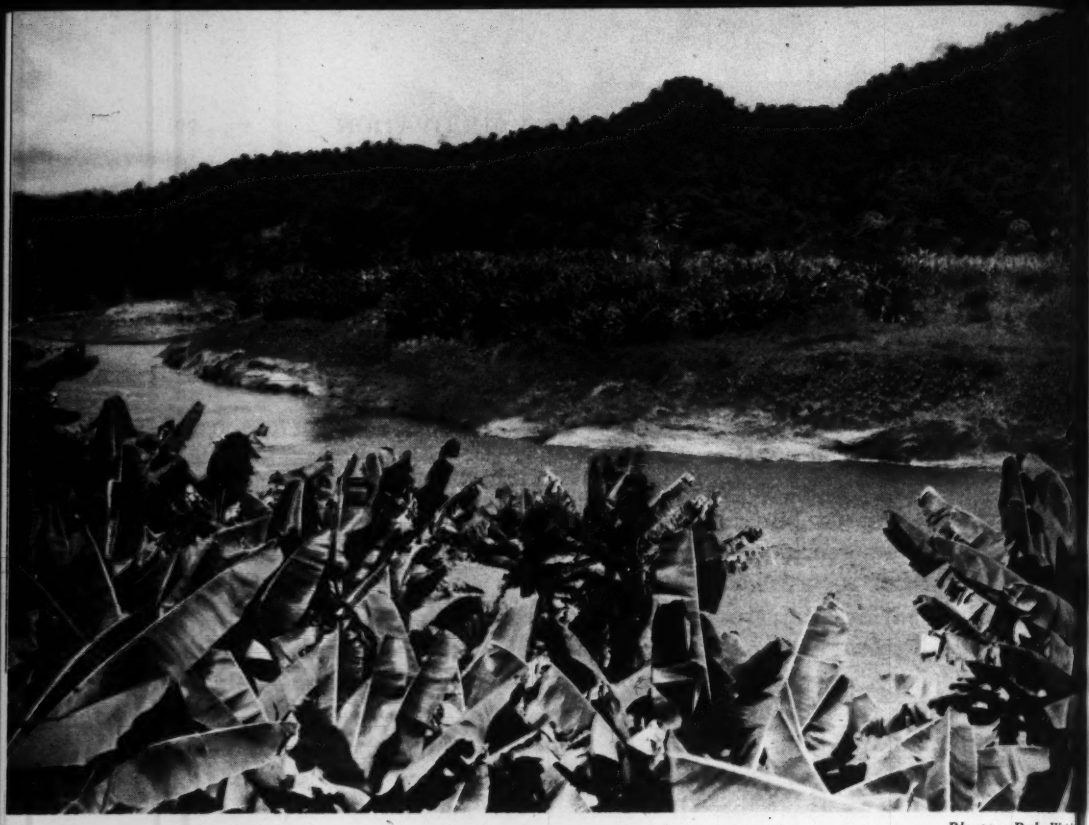

Photo: Rob Writ

Fig. 6. Semi-permanent cultivation of bananas and taro on river flats that are regularly rejuvenated by flooding. The hills in the background are used for shifting cultivation. Wainimbuka River, Viti Levu, Fiji.

alluvial soils that are periodically renewed by the deposition of river silt; and soils derived from highly basic rocks (especially basalt) which have sufficient slope for good drainage.[77] These classes of soils occupy, however, only a small part of the total area of the humid tropics, the great majority being classed as mature zonal soils. On these more level areas of "stable" soils the mechanisms for maintaining soil fertility depend entirely on the maintenance of an efficient organic cycle, for most nutrients are locked up within the plant tissue.

When the shifting cultivator uses stable soils a dynamic process of environmental change results. On clearing the forest he disrupts an ecosystem "in which climate, soil, vegetation and fauna are components in an extremely stable equilibrium".[78] Cultivation in effect takes the form of "catch crops" that take advantage of the transient availability of

[77] Kellog (1950): 271.
[78] Richards (1952): 401.

nitrogen and carbon, the main nutrients of the organic matter lying on the forest floor. Exposure to the elements leads to a rapid disintegration of humus through accelerated weathering (oxidation) and leaching, which is naturally rapid due to the porosity of most tropical soils. Thus the great majority of the nutrients that are suddenly liberated by the burn and by increased mineralisation following accelerated bacterial action are washed down to lower layers well below the root zone of most annual crops.[79] Soil analyses at varying depths throughout the profile fully demonstrate this leaching process,[80] which seems to be largely responsible for the considerable loss of nutrients in the second year of cropping.[81] The leaching away of lime makes the soil more acidic as indicated in lower pH values. Furthermore it appears that the clay fraction in characteristic tropical soils has a low absorption capacity for exchangeable bases, and many of these clays have a tendency to immobilise phosphates.[82] Exposure to the sun's rays leads to increased evaporation, and with the greater impact of heavy tropical downpours, leads to changes in structure. The steady loss of humus also affects the water holding capacity of the soil as well as structure. As a result of all these changes in composition and structure, the soil is likely to produce only one good crop.

The close dependence of shifting cultivation on soil fertility is clearly evident in analyses of changes in the soil following burning. The advantages of the burn, expressed empirically in the traditional practices of various systems, can be demonstrated. Burning leads to an accumulation of potash (probably the most prized by-product of burning) and valuable phosphates are often released just at the right time[83]—immediately prior to planting the crops that will need them. Burning produces, moreover, a marked decrease in potential acidity,[84] which is especially important in the more senile lateritic soils; it also performs a function similar to that of frost in the temperate countries in preparing a friable surface that is often ideal for the germination of seeds. In view of these facts, it can be seen that burning is not only part of the shifting cultivator's technology—a device for clearing away vegetation—but also leads to an improvement in certain properties of the soil which in some areas makes cultivation possible and generally leads to increased yields during the period of cultivation.[85]

On the other hand, burning has been shown to be on the whole a

[79] Pelzer (1958): 125.
[80] Cassidy and Pahalad (1953).
[81] Frith (1955): 184.
[82] F.A.O. (1957): 10.
[83] Dundas (1944): 124; Joachim and Kandiah (1948): 3–11.
[84] Kivekas (1939): 44.
[85] Joachim and Kandiah have demonstrated in Ceylon that crop production is greater in burnt areas than in unburnt areas. Double burning, however, gives lower yields than a single burning. (1948): 11.

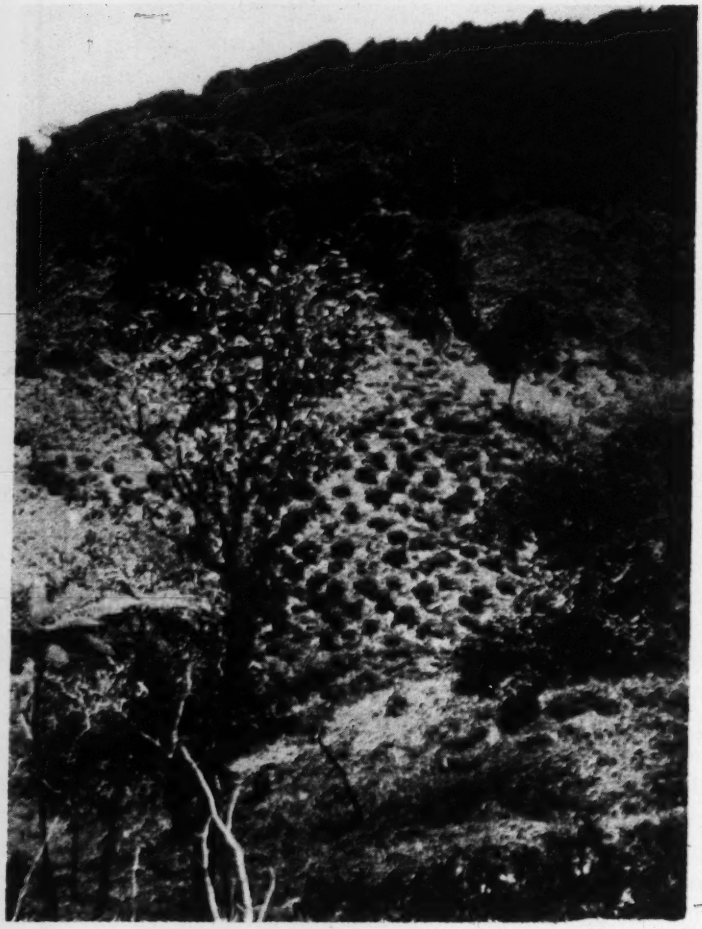

Photo: R. F. Watters

Fig. 7. A cassava garden at the last stage of cultivation before reversion to fallow. Overcultivation has led to grass becoming dominant in the valley, instead of the climax of high forest that can be seen in the background. Koro Island, Fiji.

disadvantageous practice in view of the destruction of humus[86] and consequent decreased nitrification. Valuable micro-fauna and flora are destroyed and valuable organic matter is oxidised.[87] The most detrimental effects, however, accrue from colloidal transformation, and where burning is common (or dry conditions commonly prevail) significant changes in composition and structure favour fallow growth of slower growing species that are more xerophytic and pyrophylous, tolerant of high light conditions, and able to withstand extremes of drought and

[86] An experiment in dense forest at Yangambi, Belgian Congo, showed that 20–25 tons of organic matter is deposited per acre per year. Gourou (1953): 16–17

[87] Masefield (1948): 135–138.

moisture. If burning is excessive the end result will ultimately be the replacement of high forest by a degenerate savannah flora.[88]

The full effects of burning lie, however, outside the scope of this paper. The cultivator is interested particularly in its immediate effects upon soil fertility in his garden during his tenure of the site. Having exploited the fertility inherent in the forest-covered soil, and that accruing from the burn, the cultivator abandons the garden in order that the build up of fertility may begin anew. This is a slow process, depending not only on the inherent qualities of the soil-vegetation type and on the climatic regime, but also on the density of population and the preceding history of land utilisation. The slowness of the process may be illustrated by estimates of the length of the fallow period that is needed to ensure full recuperation. These vary from about twelve years for one year of cropping in Indonesia to thirty years after one crop in the sandy soil of Benin Province of Southern Nigeria.[89]

While soil fertility in the tropics depends on such factors as water supply and aeration as well as on nutrient status, the importance of the latter stresses the need for further research into the processes of soil development and, in particular, into rates of leaching. Thus it may be suggested that the climatic approach suggested above be supplemented by classification and large-scale mapping of soils according to the properties that indicate the degree of leaching. These are the pH value and the exchangeable base status. In the soil survey of Western Samoa, these criteria have been supplemented by examination of properties indicating the stage of development, expressed here by depth of profile, subsoil colour and silica content of topsoil.[90] Such basic work is an essential preliminary for planning regional development, including the determination of the areas best suited to shifting cultivation and those in which environmental conditions suggest that a transition to permanent cultivation might be economically achieved.

Vegetation

Scientific study of vegetation types is of less value in understanding the adaptation of the shifting cultivator. Climax vegetation is not always in harmony with the contemporary environment as there is a time lag in its response to changed environmental factors. However, the vegetation type generally reflects the intrinsic soil fertility and in many parts of Central and East Africa, differences in the character of vegetation composition and structure on various steps of the catena are matched by

[88] Outstanding works in the copious literature on burning are Bartlett (1956); Aubréville (1948); Tansley and Chipp (1926). See also the bibliography by Bartlett (1955 and 1957). An excellent short account is that of Wright and Twyford (1957).

[89] van Beukering (1947): 249; Gourou (1953): 43n., citing *Farm and Forest*, Ibadan, December, 1941, p. 119.

[90] Wright (in press).

differences in the length of cultivation and of fallowing and by variations in crop associations (Fig. 8). Thus semi-permanent cropping and a wide range of crops are found on the low alluvial steps on which tall gallery forest grows, in contrast to short cropping periods and the cultivation of particular crops (such as cassava which is tolerant of a low nutrient supply) on the higher sandy steps near the "break away" of the laterite shield, where a more open grass-woodland is found. De Schlippe has noted the definite correlation between yields and the fertility of a soil as estimated by the luxuriance of its natural vegetation, but points out that chemical analysis often fails to interpret this fertility.[91] Indeed, INEAC considers secondary forest better suited for cultivation than primary forest.[92] Some peoples, such as the Kai of the Saddle Mountains, Australian New Guinea,[93] and the Hanunóo of the Philippines, prefer secondary forest to primary.[94]

Topography

In certain areas of the humid tropics, and notably in Southeast Asia, shifting cultivation is found especially in upland regions,[95] where dry rice or tubers are the staple. However, on some of the higher and cooler plateaux in parts of the tropics we find sedentary populations practising continuous cultivation—a result probably of lower rates of laterisation. In part, shifting cultivation in the uplands of intermediate elevation seems to be a response to poorer environmental conditions consequent on greater leaching rates from higher rainfall.

In some parts of Southeast Asia, early populations settled in the lowlands were forced into the uplands by later, more powerful immigrants.[96] On occupying the uplands these rice-eating peoples encountered insuperable difficulties, in terms of their existing technology, in attempting to establish wet rice terraces.[97] The result appears to have been the adoption of shifting cultivation, which, except in the highest and coolest areas, is suited to the conditions. However, in the case of the Philippines, Spencer has noted that terracing has never been part of the cultural equipment of shifting cultivators, "except as a modern afterthought". There shifting cultivation should be regarded as "an agriculture of sloping surfaces".[98] It must be stressed, however, that most tuber-based forms of shifting cultivation in the Southeast Asian uplands are of very ancient origin and probably pre-date forms of wet

[91] de Schlippe (1956): 258–259.
[92] de Schlippe (1956): 252 and references.
[93] Thurnwald (1932): 63–64.
[94] Conklin (1957).
[95] The best study of an upland society of shifting cultivators is that of Izikowitz (1951).
[96] e.g., Chaturvedi and Uppal (1953): 2.
[97] Scott (1958).
[98] Spencer (1949): 32

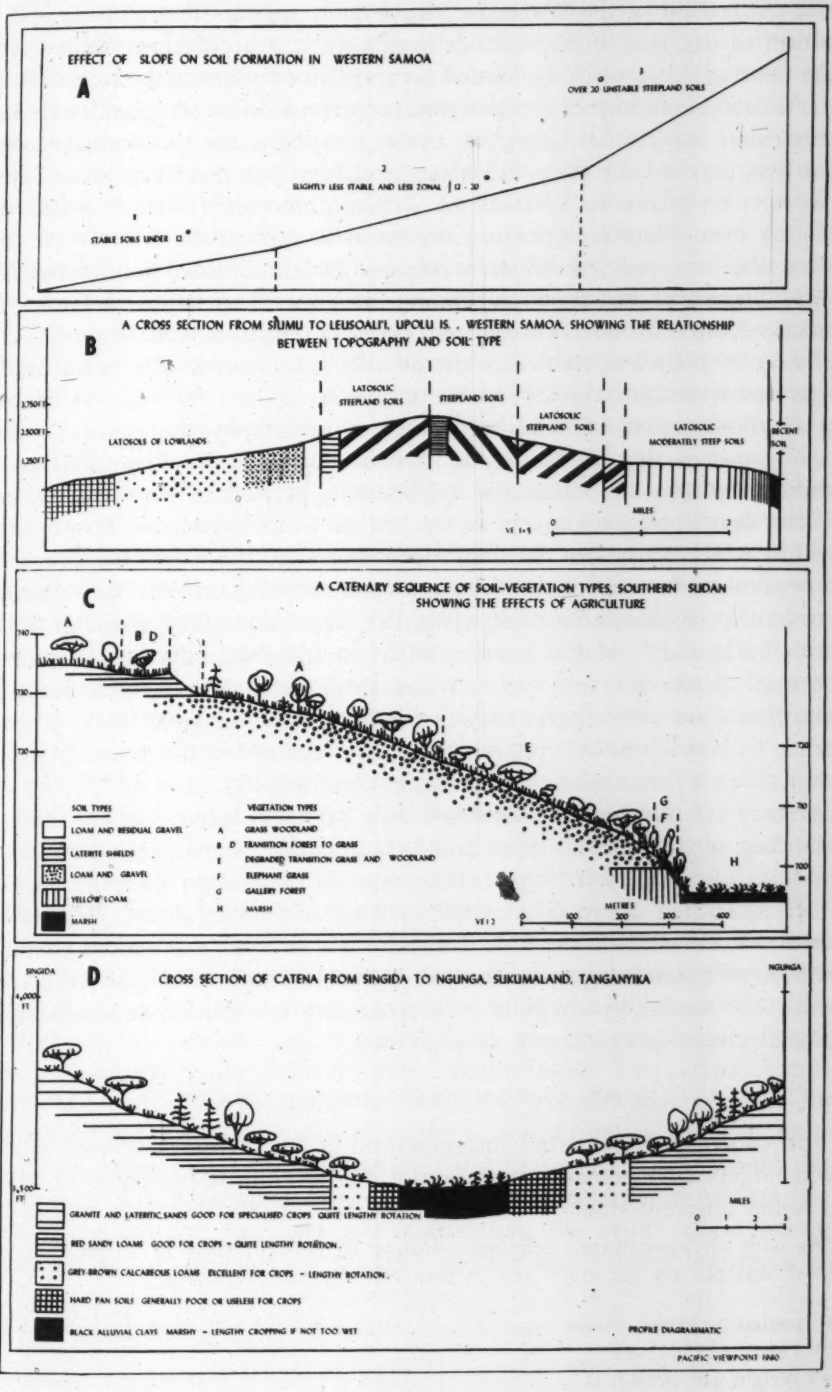

Fig. 8. Illustrations of the relationship between topography, soil development and shifting cultivation in the humid tropics.

rice cultivation of the lowlands. Moreover it appears that shifting cultivation of dry rice in the uplands may have had a different origin from the naturally or artificially flooded forms of rice culture in the lowlands.[99]

An understanding of the perennial rejuvenation of steepland soils by creep and wash (the "inorganic cycle") explains the location of many gardens perched on steep hillsides throughout the humid tropics. Thus rice can be grown in Sarawak on slopes in excess of 30°, [100] while in Samoa even steeper slopes are occasionally utilised for root crops. In surveying the soils of Western Samoa, Wright decided to distinguish three classes of soil types depending on slope. Thus soils on land not steeper than 12° were classed as "stable", those on land from 12° to 20° as "slightly less stable", while over 20°, soils were of a "steepland" type and were "unstable" (Fig. 8).[101]

A classification of soils according to topography that has a wider significance is that based on the "catena concept". Realising that soils and topography are often not haphazardly related in East Africa, G. Milne developed the concept of the catena as an organising framework within which variations became more meaningful. In the characteristic topography of many parts of East Africa, receding erosion has exposed strata of rock in a series of staircase-like steps proceeding downhill from the "breakaway" of the laterite shield to the river edge in the valley bottom. While all soil types within this "catena" have genetic and morphological differences, they are nonetheless "linked in their occurrence by conditions of topography and are repeated in the same relationship to each other wherever the same conditions are met with".[102] The catenary relationship of soils is not only useful in increasing our understanding of tropical soil types and in facilitating their mapping, but also adds to our understanding of differences in cultivation patterns, as we have illustrated above. Thus while shifting cultivation is not uncommon on stable lowlands in the humid tropics, it is in some ways more characteristic of upland regions with their higher leaching rates and steepland soils. The degree to which its occurrence can be regarded as a reflection of the cultural level will now be examined.

THE INFLUENCE OF CULTURE

In contrast to his earlier interpretation in *The Tropical World,* which was largely environmentalist in nature, Pierre Gourou presented in 1955 a rather different view:

"As with all agricultural techniques, ladang is the expression of a civilizational level and not the result of any inescapable physical constraint."[103]

[99] Bartlett (1958): 45–46.
[100] Leach (1950): 89.
[101] Wright (in press).
[102] Milne (1935): 197.
[103] Gourou (1956): 339.

Most exponents of this view base their position on the fact that no advanced autochthonous civilisation has evolved in the tropics with the possible exception of the Mayan civilisation of Central America, and one or two civilisations in tropical Africa. Although it might be argued that the exception disproves the rule, a certain amount of evidence suggests that the culture hearth of the Mayan civilisation may not have been in the Petén plain of the lowlands, but in the mountains of Guatemala, where tropical conditions were considerably modified.[104] However, it is clear that shifting cultivation formed the economic basis of the Mayan civilisation sited on the lowlands of Guatemala and Yucatan. It is significant, though, that the soils of the central Petén area are rendzinas—one of the better soils of the humid tropics.[105] While the reasons for the downfall of the Mayan civilisation are still obscure, Gourou's thesis that it was caused by soil exhaustion resulting from over-population is convincingly argued.[106] If this conclusion is true, it is clear that shifting cultivation in tropical America at least is an inadequate economic base on which to attain and perpetuate a high civilisation. It is significant that the advanced civilisations of Southeast Asia represent the elaboration of culture traits imported from elsewhere, and were in fact "hydraulic civilisations" based on the sure economic foundation of flooded ricefields. The Zimbabwe civilisation of Southern Rhodesia, and possibly that of Benin in Nigeria, are nonetheless isolated examples in an unrewarding environment and are quite remarkable under these environmental circumstances.

The cultures of shifting cultivators in the humid tropics are then characteristically undeveloped and represent a relatively low cultural level. Whatever theory of cultural evolution may be held, the mechanisms of change appear to be reasonably clear: environmental change producing disaster and invention, diffusion in the form of the introduction of new crops, tools, techniques and ideas, and diffusion that leads to imitation. In the humid tropics, little is known about environmental change in the last few thousand years, but it seems clear that the striking differences in culture that do exist result very largely from diffusion and consequent cultural elaboration. According to Terra it is essentially "the cultural inheritance" of migrating peoples that explains the existence in Indonesia today of various agricultural systems in areas that are often quite unsuited ecologically to them.[107] Few would disagree with this contention with regard to the distribution of pastoralism, mixed agriculture, and wet rice cultivation, but with regard to the distribution of societies of integral shifting cultivators, the force of

[104] Gourou (1953): 45n.; Steward (1955): 191, based on sources cited in 187n.–188n.
[105] Ferdon (1959): 13.
[106] Gourou (1953): 43–51.
[107] Terra (1953).

environmental circumstances seems to be a more adequate explanation.

In the early occupation of the Philippines, however, it appears that shifting cultivation was so much part and parcel of the immigrant's social heritage that it influenced the pattern of settlement:

> "The Neolithic farmers who first came to the islands were not all of the same mould, so that some of the inland and more hilly landscapes had an appeal for some groups, while others were most attracted by the swampy, flattish littoral."[108]

This is an interesting parallel to the settlement of Britain since Neolithic times where there has been a strong correlation between the environmental conditions sought out and the level of technology of the invaders. However, the infrequent occurrence of shifting cultivation on the well-watered lowlands throughout Southeast Asia as a whole[109] suggests that the demonstrably superior productivity of other agricultural systems has ousted shifting cultivation in these regions, even if it were part of a population's cultural heritage.

Cultural evaluations of environmental potentialities seem to be closely bound up with the level of technology. It is in fact in its technological dimension that any cultural interpretation of shifting cultivation must largely be based. In general, technology reflects a close adjustment to the environment. Thus in many parts of Africa a hoe that is used to scrape only the top two inches of soil is designed with the blade at such an acute angle to the haft that it can be used only for this special purpose. The digging stick that is so common in Southeast Asia and Oceania is admirable for levering up roots in the jungle clearing. With the evolution of tools suited to the qualities of tropical soils, it is no wonder that little further invention occurred. Thus in South America the nearest equivalent to a plough was the foot-plough of the Incas—who dwelt in atypical conditions in the highlands. Elsewhere evolution of the plough occurred only exceptionally, and modern experience suggests that it is generally unsuited to agriculture in the humid tropics.

While many items in the material equipment of the shifting cultivator express the close adjustment achieved, many tools can only be described as inferior in comparison with those of extra-tropical cultures. Thus the stone axe is a very inefficient clearing tool in comparison with the steel axe, and the digging stick that is so effective in the forested clearing is most inadequate in uprooting the deep rhyzomes of grasses like *Imperata* spp. in environments where grasses have become firmly established. The extreme difficulty of tilling the soil and mastering the weeds in a permanent form of cultivation when only inefficient tools were available[110] may be a sufficient explanation of shifting cultivation in some favoured areas, but the persistence of the system in modern times when improved tools have been introduced shows the inadequacy of

[108] Spencer (1949): 29.
[109] Taylor (1953) has a map of agricultural systems in Southeast Asia.
[110] See Ormeling (1957).

this view. Indeed, it can be said that the West, with all its technological resources, has not yet solved the problem of how to utilise permanently many of the large areas of stable soils that comprise the lowlands of the humid tropics.

The influence of culture as a whole can best be appreciated when it is realised that patterns of culture amongst shifting cultivators are on the whole strongly coloured by environmental influences. In addition to technology, many elements in other levels of culture bear evidence of the relationship. Thus the permanent attachments of a Bemba to tutelary deities associated with the soil are rivalled only by those concerned with human relationships within his lineage group.[111] Amongst the Iban of Sarawak, "every stage in the actual cultivation of padi is accompanied by rites, which in Iban eyes, are vital to the success of the crop". The series of rites is described as a "continuum" and as a "formidable labyrinth of diverse elements".[112] It is indeed common for the richest historical associations and greatest elaborations in any sector of culture to surround the principal crops cultivated. In this labyrinth of ritual the influence of the environment is evident though often muted. Social organisation too is often attuned to the contingencies of shifting cultivation. An atomistic form is frequently characteristic of cyclic migrators. The social organisation of the migratory Iban is "telescopic", allowing temporary sub-division of the long-house community into a series of subsidiary groups and the association and reassociation of extended families.[113]

A good deal of the culture content of any people cannot of course be explained by reference to the environment, but only by a process of interaction of a multitude of elements within different dimensions of the culture itself, or by the introduction of new elements into the body of the culture from outside. In some instances the dominance of some of these supra-organic features of culture directly influence aspects of shifting cultivation. The fields of the Dogon of the French Sudan, for example, are of a twisted quadrilateral shape in accordance with their cosmological view that the world developed in the form of a spiral. Two sides of each field form a very wide angle opening up towards the land that will subsequently be cleared. This angle is said to symbolise the continuous extension of the world.[114] Such examples of the force of

[111] Richards (1939): 237.
[112] Freeman (1955): 32.
[113] Freeman (1955): 39.
[114] "In theory the central point of development is formed by three ritual fields, assigned to three of the mythical ancestors and to the three fundamental cults. When laid out they mark out a world in miniature on which the gradual establishment of man takes place. Starting from these three fields, the fields belonging to the various kin groups, and finally various individual fields, are sited along the axis of a spiral starting from this central area." Griaule and Dieterlen (1954): 94.

cultural influences, however, seem to affect superficial rather than basic features of the form of cultivation.

The role of culture is perhaps most effectively seen in the range of choice that is available to the individual cultivator. Within the basic limits of agricultural practice defined by environmental factors, cultural preference defines further limits. However, it appears that in these "hard environments" of the humid tropics, culture maximises the individual's chances of success by guiding his choice. The Bemba cultivator of Northern Rhodesia seemed to Audrey Richards to have a bewildering number of choices of action, there being "as many grades between the fool and the wise man as in any community of our own".[115] De Schlippe, on the other hand, has shown convincingly that experience canalises the range of action (amongst the Azande, at least) into several well-tried patterns. Concrete expression of this process is seen in the limited range of field types, which represent collective "simplification and codification" over the ages.

While our understanding of the nature of culture is still limited, and there is a general dearth of information on the cultures of shifting cultivators, it still seems that many elements of the dimensions of many cultures are adaptive in the sense that they reflect the society's response to its physical environment. Thus much of culture must be conceived as linked with environment as part of a total ecosystem, and while traditional agriculture appears as the most important part of culture in its "function of ensuring the survival of the group in its habitat", its basic features exemplify relationships dominated by environmental qualities.

POPULATION DENSITY

The last significant set of factors which influence shifting cultivation are those concerned with population density. Indeed the density of population is generally the direct determining factor in the process of rotation, for a rising population in any area demands an extension of the period of cultivation or a shorter resting period of the *belukar* area. Both result in a steady deterioration in soil fertility. Increasing population pressure is the most serious of all problems facing the shifting cultivator today, for the land—an expendable resource—is usually his sole means of livelihood. However, since this question involves mainly the effects of this agricultural system, a full consideration lies outside the scope of this article.

The most thorough study of the "carrying capacity" of a large area utilised by shifting cultivators is that of van Beukering, who found that in Indonesia shifting cultivation could maintain a population of 130 people per square mile "for a long time".[116] This figure has often been

[115] Richards (1939): 229.
[116] van Beukering (1947): 249.

Photo: R. F. Watters

Fig. 9. The transition to permanent cultivation in a fertile environment as a result of growing cash-consciousness and effective extension work. Cocoa trees (left) interplanted with bananas and subsistence crops of "giant taro" (*ta'amu*) and taro. Upolu, Samoa.

made the basis for generalised pronouncements on the upper limits of population, irrespective of the level of soil fertility, type of farming system, percentage of land that is cultivable, level of technology, cultivation practices and size of the labour force. Moreover, such pronouncements ignore the fact that the estimate assumes than one hundred per cent of the land area is cultivable. In contract to this high figure, the infertile Serenje Plateau of Northern Rhodesia is estimated to have a maximum carrying capacity in perpetuity of only six persons per square

mile.[117] The range in productivity per acre varies greatly throughout the humid tropics; it has, for example, been noted that a much lower mean density of population can apparently be supported in Sarawak than in Burma, as the swiddens have to be very much larger to support a garden family of the same size.[118] It is clear, nevertheless, that the efficient operation of a form of shifting cultivation depends on the maintenance of a low density of population. This is, however, more of a consequence than a cause of the system. A low and stable population expresses the balance that has been achieved between man and environment. In the pre-European era population growth was limited by either disease, harvest failures and tribal wars or by mechanisms evolved by the society and expressed in its institutional structure.

Changing environmental conditions inevitably react on the economic conditions of the inhabitants. Thus an incipient decline in soil fertility is expressed in the increasing distance from home to swidden. Ironically enough, one of the most disabling features distinguishing the system—its shortage of labour—is usually overcome only when the system is breaking down due to the steadily rising pressure of population. An efficient and stable form of shifting cultivation is characteristically a labour-extensive type of agriculture.

ECONOMIC FACTORS

Some authorities have seen certain economic factors as basic in explaining the nature of shifting cultivation. Integral shifting cultivators have a closed economy in which production is based almost entirely on human energy. Yields per acre appear to vary widely compared to other agricultural systems, but it is clear that yields per man-day are high in Southeast Asia. Gourou regards this fact as significant in explaining why the Moi Rhade of the Annamite Cordillera of Indochina abandoned the plough and wet rice culture to return to their traditional shifting cultivation once administrative pressure was relaxed. Not only was shifting cultivation an integral part of their cherished culture, but it gave a higher return per man-day compared with unfertilised permanent rice fields.[119] The universal aim of obtaining a reasonably large harvest with as little effort as possible underlies this extensive system, and appears to explain in the main, the adoption of shifting cultivation for the first time by some groups of new colonists settling thinly inhabited areas. It appears, however, that yields per man-day are low in many parts of Africa.

In most forms of shifting cultivation, the labour requirement is distinctly low and discontinuous in comparison with other agricultural

[117] Peters (1950).
[118] Leach (1950): 88–89.
[119] Gourou (1956): 345.

systems. Although Freeman stresses the uncertainty of his figures, his maximum totals for the Iban of Sarawak come to only seventy-one man-days per acre[120] for cultivation in virgin jungle, or sixty-six in secondary jungle, with a further thirty days or so spent in fence building, watching and other tasks for the whole farm.[121] The equivalent figure of 1,220 man-hours per acre for the Hanunóo of the Philippines is rather higher.[122] In the Southern Sudan, the monthly maximum of agricultural work by the Azande is only fifty-four per cent of total possible effort and the monthly minimum falls as low as five per cent.[123]

In spite of this low labour requirement, a severe limit is imposed on the scale of agricultural activity by the small number of labourers available in each garden family. The critical limiting factor to the amount of land cultivated may well be the area that can be effectively weeded by the labour force available, as it is with the Iban.[124] One study at least suggests that a shortage of labour is a reason for the cultivator letting his oldest swidden relapse into forest each year.[125] Nevertheless, this can hardly be considered the primary cause of abandonment.

The absence of marked specialisation of labour in many societies also appears to be connected with the extensive nature of shifting cultivation. This means that every individual has to be trained in the use of almost all tools and methods, leading to excessive duplication of function. Since the knowledge of the average individual comes far closer to the total collective knowledge than in more advanced societies, there is a marked generalisation of economic effort. Custom decrees that activity be directed into certain stereotyped channels, thus stifling initiative and leaving little scope for any incipient trends toward specialisation. It is clear that in overcoming the problems associated with shifting cultivation there will have to be considerable cultural advance in the field of social organisation to permit specialisation of labour.

The breadth of the economic base of any society of shifting cultivators depends to some extent on their ability to store or preserve foods. Where these skills are possessed to a high degree, there often seems to be an intensification of agricultural activity during the growing season of the major crops, allowing considerable scope for leisure in the rest of the year. This may obviate any seasonal nutritional strain as well as any consequent limitation to the amount of work achieved.

A major economic handicap is the extreme difficulty of accumulating and conserving wealth in a shifting field system. In contrast to the fixed

[120] A "man-day" is defined rather loosely as "a normal day's work for either a male or female". Freeman (1955): 89.
[121] Freeman (1955): 90.
[122] Conklin (1957): 152.
[123] de Schlippe (1956): 168, 154.
[124] Freeman (1955): 56.
[125] Richards (1939): 314.

wealth or improved value characteristic of European holdings, shifting cultivators repeatedly have to start again with nothing with the commencement of every new cycle. It is not surprising, therefore, that wealth never exceeds a certain level, consisting only of perishable goods.[126] The diffusion of wealth by various social obligations of a customary nature is, however, the main reason for the absence of accumulated wealth in most of these societies. Such chronic poverty seems to underlie that characteristic quality of inertia which has often been noticed among shifting cultivators.

On the whole, such economic conditions seem to be secondary rather than primary factors in the perpetuation of this economic system. Essentially they are consequences of the primary physical factors, and while they are effective in the total interrelated complex and partly distinguish the system as a whole, changes in the economic organisation of some societies following Western contact seem to be insufficient in themselves to lead to any form of continuous cultivation in which soil fertility is permanently maintained.

CONCLUSION

This paper has undertaken a broad survey of shifting cultivation in an attempt to ascertain the basic conditions in which it exists. Arguments for and against are frequently waged; not all, however, recognise the many facets of the system.

The wide variety of agricultural activities that is comprehended in the term "shifting cultivation" has been indicated in a classification of eight major types. This differentiation on an economic basis was followed by a further subdivision on the basis of twelve criteria that are significant for a thorough understanding of the man-land relationship and which define the conditions on which each form can be judged. A further division was made according to whether the societies are migratory or not and long cycle migrants were distinguished from those with a short cycle.

In attempting to elucidate the many factors that influence shifting cultivation, a working hypothesis was formulated which emphasised the importance of many individual elements in the environment and in the culture of the shifting cultivator. A structural consideration of the influence of such elements as soil type, climatic conditions, and cultural preferences sheds some light on the system. Such a structural approach leads naturally to a functional conception, for the nature of relationships between elements is often more important than the nature of the elements themselves. Introduction of the time dimension provided a dynamic view of the operation of these relationships throughout several phases in the cycle of cultivation. A consideration of such concrete features as field types illustrated the arrangement of elements in their

[126] de Schlippe (1956): 198.

structural order, and threw some light on the relationships that existed and the processes that produced them. A further method of examining the system was then employed in a more technical analysis of the conditions of climate, soil, vegetation and relief that are commonly found in regions of shifting cultivation, and the influence of each was assessed. In particular it was stressed that the length of the dry season was closely linked with the rate of leaching, which was one of the most important environmental processes affecting the length of cultivation and the length of fallowing. The natural processes that resulted in a steady decline in soil fertility were seen to be accelerated by the various phases of cultivation. The differences in fertility-maintaining mechanisms were stressed in comparing stable and unstable soils, and the transient nature of soil fertility was noted (especially on stable soils) when the balance of nature was disturbed. Shifting cultivation was found to be closely articulated to these conditions. The role of culture was seen to be in many ways complementary to that of the environment, since much of its character is strongly coloured by connections with nature. Population density was found to be effective in defining an upper ceiling above which an efficient system could not be perpetuated and economic factors were seen to be of relatively slight significance. The universality of shifting cultivation throughout the tropics suggests that convergent evolution has occurred, resulting largely from a common set of environmental conditions.

Thus the shifting cultivator appears as "a man struggling in a hard environment", far from omnipotent over nature nor yet impotent in the face of its influences. Through the medium of his technology and with the aid in particular of fire, he is indeed the ecological dominant. But in a stable, integral form of cultivation, man was still part of the total ecosystem, in harmony with environmental conditions. Thus it may be said that the shifting cultivator was aware of the design in nature and he strove always to adapt himself and his culture to it. He could, however, improve the design in certain respects (e.g., the beneficial effects of burning), but experience taught him, through the medium of his culture, the boundaries to human action. Consequently shifting cultivators had reached a stage of "ecological climax" beyond which little cultural evolution could occur until the whole ecosystem was disturbed. This disturbance has occurred in general with the impact of the West. Rising populations and the introduction of a new set of values that came from the temperate West have set in train a process that has led to rapid changes in the environment, and destroyed the old balance between man and nature. It would not be possible—nor indeed would it be desirable—to try to recreate the old relationship; the task of this generation is to establish a new relationship that does not violate the "design of nature" and yet is consistent with the needs of a twentieth century world.

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A—Wright (in press).

B—Wright (in press); "Upolu", 1:100,000, Lands and Survey Dept., Apia, Western Samoa, 1957.

C—de Schlippe (1956): 40–41.

D—Malcolm (1953), soil map, and 174 ff.

The Asian and Pacific Scene

POPULATION AND EMPLOYMENT PROSPECTS IN JAPAN

With the fifth largest population in the world, a population of over ninety million, hemmed in on pocket-sized plains between mountains and sea, Japan is confronted with the major problem of finding employment for over one million new workers each year.

Tachi Minoru ("Population Problem", *Japan—Its Land, People and Culture*, Tokyo, 1958, p. 212) gives the population density at the last census year, 1955, as 246 persons per square kilometre. This population density ranks third in the world, exceeded only by Belgium and the Netherlands. Forty-five per cent of the population is engaged in agriculture but food-producing land is limited. There are only 139 acres of arable land per 1,000 of population, whereas the United Kingdom has two and a half times as much arable land per 1,000 of population, India has seven times, and U.S.A. has twenty times. This lack of arable land, coupled with the scarcity of other natural resources, inflicts on Japan the greatest population pressure in the world.

The dramatic increase in population after the war was due to several unusual factors. Chief amongst these was the repatriation of Japanese nationals from the former Japanese Empire. In five years the total reached six and one-quarter million persons; this was offset in part by over one million foreign nationals who returned to their own countries. The repatriation, which chiefly involved males, balanced a wartime decrease in males in the homeland. A second factor was the baby boom of 1947 to 1949 following postwar marriages. The temporary decrease in population in 1945, a result of over two million war deaths, was thus soon made up and the population soared to new heights.

It has been emphasised by most writers that "the most important characteristic in the structure of the postwar increased population was the expanded population of the productive age group". ("Population", *Japan Annual Publications*, Tokyo, 1958, p. 317.) Not only is the present productive age group of those aged fifteen to fifty-nine large, some sixty per cent, but with reduced mortality there is a high probability that most of the children of the baby boom period will live to reach the productive age of fifteen years. Japan's immediate difficulties lie, not with present or future Japanese babies, but with the absorption into the economy of the children who have already been born and who are now moving into the productive age group.

The live birth rate today is at a low level, comparable with such countries as New Zealand and U.S.A. Births are controlled by contraceptive methods and induced abortions ("to safeguard the mother's health"). The Japanese have no religious prejudice against birth control and with a generally high level of educational facilities family planning is spreading from urban to rural areas and it is considered that the birth rate will fall still further. Tachi Minoru points out that on an average each woman in Japan was giving birth to 2.36 babies and if this rate is reduced to 2.3 babies and the mortality rate remains at its present level, the population will become static. It is not thought that the death rate, already low, can be appreciably lowered in future. Inevitably it will rise as an increasing proportion of the population become aged; but this will have little effect in the near future and the population will top the hundred million mark in the early 1970s. Some authorities estimate that the present one per cent

increase in population will give place to a decrease by the 1990s. It is also estimated ("Population", *Japan Annual Publications,* Tokyo, 1958, Table IX, p. 323), that in the early 1970s the productive age group will rise to sixty-seven per cent and remain at this peak before gradually declining about 1990.

Shigeto Tsuru ("Employment in Japan: Problems and Prospects", *Far Eastern Survey,* 26, 7, July 1957) states that in the period 1950–55 the bulk of the expanded labour force was absorbed into the tertiary industries and only seventeen per cent into manufacturing, but he indicates that this imbalance may have been a result of wartime dislocation. It is of great significance that the number employed in agriculture decreased during this time; no longer can townspeople retreat to the rural area in times of economic hardship.

There were only three-quarters of a million fully unemployed persons in 1955. Disguised unemployment and underemployment are, however, characteristic of the Japanese economy and Dr Tsuru estimates that as much as twenty-five per cent of the labour force falls into these categories. Included would be family labour employed on farms, or in small industries, those classified as "not in the labour force" but who wish to work, and low-income independent proprietors. Some of these people work long hours on piecework, yet receive inadequate compensation and produce little. Underemployed people can be included with those entering the labour market. Dr Tsuru states:

"We may say that a full employment program for Japan in the immediate future has the task of creating roughly 900,000 to 1,150,000 jobs per annum, depending on the modesty or boldness of the planners."

After stating that the critical years will last until about 1970, he continues:

"If we can plan and implement a massive public works program for this period employing something like 500,000 man-years per annum in labour-intensive projects, the question of absorbing the remainder will not be very serious."

He goes on to state:

"But this possibility must be considered somewhat academic, since the present administration in Japan does not seem to be thinking in terms of an emergency public works program."

With primary industries already over-supplied with labour the annual additions of about one million workers must be absorbed into the secondary or tertiary industries. This implies that in these industries there will be an annual growth in the labour force of over three per cent. Japanese industrial employees increased in numbers at less than two per cent during the last decade in a period of phenomenal growth and it is not considered that this rate can be increased. Productivity too must rise if Japan is to remain competitive in the export market and an increase in the number of employees would not necessarily result in increased production.

Expansion in future will probably be in the heavy and chemical industries which demand high capital investment. Direct United States aid, an important source of new capital, ceased in 1952 and procurement expenditure for the Far Eastern forces is chiefly important for helping to close a balance of payments gap, not in providing new capital. Thus capital for expansion must now be raised internally. By Western standards the Japanese have a low national income, one-quarter that of the British, and as a consequence a low potential of investment funds.

Limits on industrial expansion are imposed too by Japan's dependence on imports of raw materials, which in turn must be paid for by increased exports. In 1957 imports exceeded exports by thirty per cent, bringing to a head an economic crisis and although deflationary measures restored some stability the need for additional imports would impose further strains. Labour-intensive public

works directed to increasing food production would have some effect on reducing imports but in 1958 raw and fabricated basic materials made up 62.5 per cent by value of imports and foodstuffs only 19.7 per cent.

There has been a tremendous state drive to increase exports, with the "link system" to stimulate manufacturing, trade agreements—particularly with South Asian countries, and a large advertising campaign in both the East and the West. Southeast Asia, taking twenty-five per cent of her exports, and North America taking twenty-three per cent, are still Japan's best customers but Africa now purchases sixteen per cent of Japanese exports. Trade with China is desirable, but this is a casualty of continuing American friendship and goods which Japan desires from China are those which are most needed by that country for its own development.

Dr Tsuru considers that the expansion of exports is the most vital factor which will stimulate employment but he does not overlook some combination of an export drive with a public works programme. American goodwill is probably the main sheet anchor upon which Japan will rely in the difficult times which lie ahead.

J. W. MACNAB

THE INDONESIAN DILEMMA

Indonesia, with a population of 84 millions growing at the rate of 1.4 per cent per annum, with great contrasts in population density and levels of development, and with a continuing unstable economic and political structure, poses in an acute form the problems facing the underdeveloped nations of Southeast Asia.

The consequences of overpopulation, as exemplified by Java, are the theme of an illuminating analysis by N. Keyfitz ("Développement économique et accroissement de population: un exemple actuel en Indonésie", *Population*, 13e année, 3, pp. 433–440, July-September 1958). As Mr Keyfitz points out, Malthusian theory would lead one to believe that overpopulation might well favour development. Competition between workers would tend to reduce wages to the minimum, and thus permit capital accumulation. In fact, this is not what happens when, as in Java, social customs ordain the sharing out of what work there is. With the Javanese, as with us, work is only necessary because it gives a claim to income (as Professor Galbraith has pointed out, it may well be essential for *The Affluent Society* to divorce production from income and give the latter even to those who do not work). As the population grows, so more and more people are used for the same job. Buffaloes are displaced by men, and fields are dug instead of ploughed. (This degradation of the individual is something which those who object to birth control never take into account.) The consequences for economic development are disastrous. Before the population grows, the countryside produces a surplus of foodstuffs which is sent to the town in exchange for manufactured goods. With more rural mouths to feed, the surplus steadily diminishes, and the towns find that the effective demand for their goods falls. With less food available, its price rises and compels demands for higher wages. Employers turn to labour-saving machinery and techniques; the economy begins to follow a vicious circle. Unemployment and underemployment are continually increased.

From the above, it is clear that mechanisation and other labour-saving techniques applied in the country can have the effect of denying people their right

to a share in the harvest. Far better to install urban manufactures of consumer goods other than foodstuffs. Country people will then be more eager to save some of their share of the harvest for exchange with urban goods. If this process is not to be frustrated, however, urban industry must be of the labour-using rather than the labour-saving variety; the latter simply throws more people into unemployment.

It is sad to record that these requirements of the situation are far from being met. On the contrary, the industries being set up in many parts of Asia are among the most highly mechanised—cement factories, power stations, chemical plants—while earthmoving is often by bulldozer. In a situation where capital is scarce but labour plentiful, this is hardly a rational policy.

The choice, as Keyfitz stresses, appears to be between the totalitarian method of destroying the social institutions which ordain the sharing-out of work, or the democratic method of changing the institutions slowly, but rapidly increasing the supply of food. It would be as well if those concerned with Asian development bore these choices in mind.

It is sometimes argued that overpopulation would be solved by moving people from the more to the less densely populated parts of the world. This overlooks the fact that the populous areas are probably so for good reason. This is clearly illustrated by W. F. Wertheim's study of the movement of Javanese to the southern part of Sumatra ("Sociological Aspects of Inter-Island Migration in Indonesia", *Population Studies*, XII, 3, pp. 184–201, March 1959). The conclusion emerges that the migration simply transplants the population problem; it does not solve it. The soils of Sumatra are nowhere near as fertile as those of Java, and the centuries-old irrigation works of Java are lacking. Furthermore, the "spontaneous" migrants, who are not under government control, are following practices which are eroding the soil.

The lesson to be drawn here is that overpopulation cannot be deduced from a mere statement of the number of people to the square mile. Many other factors have to be taken into account: the quality of the soil and, especially, the technology in use, are among the most important. The Javanese migrating to the outer islands adopt no new technology, but retain the old. It barely gave them a living in the fertile soil of Java, it does little better in Sumatra.

Professor Wertheim could also have mentioned the important finding by H. de Meel ("Demographic Dilemma in Indonesia", *Pacific Affairs*, Vol. 24 (1951), pp. 266–283) that the rate of reproduction on the outer islands is greater than it is on Java. It is therefore abundantly clear that migration of population to less populous areas is likely to be self-defeating and simply postpones the measures that have to be taken. Professor Wertheim consequently favours immediate industrialisation of the less populous islands as well as of Java; subject to the proviso that the industry should be adapted to the conditions of Asia, mentioned above, one can endorse his plea.

A self-defeating internal "migration" programme, the erection of labour-saving industries, are only two examples of the ineptitude with which Indonesia is tackling her economic problems. These problems have been discussed by J. M. van der Kroef ("Indonesia's Economic Future", *Pacific Affairs*, Vol. XXXII, No. 1, pp. 46–72, March 1959) whose article should be read by all concerned with economic aid programmes in general, or Indonesia's development in particular. It is likely to shatter many comfortable illusions.

Indonesian developments lead one to wonder if the universal education recommended as a nostrum for underdevelopment does not, in fact, militate against it. One of its first consequences is to arouse demands for the absorption of the educated into the government service. In an underdeveloped country, by definition, few other outlets are available. Indonesia has succumbed to this pressure.

The author tells us that before the Second World War the total number of colonial government employees in all categories remained below 250,000. By 1955 the figure had grown more than fivefold; and they consumed nearly forty per cent of government revenue. Such large numbers must be given work: or at least nominal responsibilities. Hence the entry of the State into every possible field. (The polite term for such empire-building is "collectivism".) Unfortunately, the bureaucracy's activities are now repressing economic activity, not encouraging it. As the author states (p. 61) " . . . the seemingly endless manipulation by the government of all phases of production and the resulting drying up of many primary sources of wealth, these are of [Indonesia's] own making".

The detailed results are saddening. Widespread corruption in the bureaucracy; the erection of state corporations with incompetent political appointees in charge; the creation of a parasitic "entrepreneurial" class who neither produce nor take risk, but are subsidised by government; the growth of a new landlord class which pays virtually no tax; shortages of consumer goods, even the all-important petrol; a continuing inflation oddly coupled with a recession of domestic industry; discouragement of foreign capital; and the increasing use of foreign exchange for consumption purposes at the expense of domestic industry.

The dilemma it poses for those who wish to help is obvious enough. If aid is given in present circumstances, the probability is that it will be wasted. Yet no foreign government could insist that the heads of state corporations be chosen for their efficiency rather than their politics; nor that the domestic producers have the bureaucratic shackles removed; nor that the government favour small labour-using industry rather than the highly mechanised. It seems we must be content to insist on the efficiency of the projects to which we contribute directly, and have faith that in the welter of inefficiency and corruption, they will still do some good.

LESLIE H. PALMIER

CARGO CULTS AND SOCIAL CHANGE IN MELANESIA

Over the last few decades culture contact between the West and the native societies of the Pacific, Africa and the Americas have induced varying forms of social change in these areas. The character of this change depends mainly on the force of Western impact, the agents of contact, world market conditions, and the character of the native culture in question. In particular, native societies have had to face many problems of cultural adjustment that have arisen at both the personal and group level. The process of change often becomes articulate in various "movements of protest" that vary from "cargo cults" among some of the less advanced cultures, to the formation of political parties or trade unions organised largely on an ethnic or cultural basis among the more sophisticated, urbanised societies.

To a geographer, many of these "expressions of a people in distress" seem to stem initially from a condition of disequilibrium between man and his environment resulting from the penetration of Western culture. Accompanying this disturbance of the native's adjustment to his habitat is the more serious shattering of much of his traditional value system and other focal elements in his culture, leading to bewilderment, frustration and a sense of inferiority. It is these economic and mental revolutions which, under certain conditions, give rise to cargo cults. Some of the most famous of these numerous cults have been the Tuka movement

of Fiji, the Milne Bay Prophet movement of Papua, the Taro cult of Australian New Guinea, the Vailala "Madness" of Papua, the Naked Cult of Espirito Santo, New Hebrides, the John Frum movement of the New Hebrides, the "Dog" movement of the Duke of York Islands, and Masinga Rule in the Solomons.[1]

What is a cargo cult? A typical movement has been described by R. M. Berndt in "A Cargo Movement in the Eastern Central Highlands of New Guinea" (*Oceania*, XXIII, 1 and 2, Sydney, September and December 1952). In 1944 in some villages in the area rumours spread from the Markham Valley that various goods had been sent to them by the spirits of their deceased kinsfolk. It was believed, however, that Europeans had intercepted them, and instead of passing them on had put them in trade stores, requiring the people to work for money in order to procure them. Having discovered that the commodities had been stolen, the spirits were now ready to come and distribute them to the rightful owners. Their arrival would inaugurate a new way of life. To prepare for this event a leader (an ex-indentured labourer) was appointed to serve as a medium between the people and the spirits with whom he communicated on a "wireless". Graves were swept clean, weapons, utensils and surplus food destroyed, and gardens neglected. Outside the leader's special house a pole with rungs was erected for spirits to climb up to God, and at its base the followers were anointed with coconut oil. It was believed that anointing would enable the people to shed their skins and so become white; then they would receive all the goods and clothing used by Europeans.

A better known movement is the cult called Masinga or Marching Rule, which flared up in Malaita and neighbouring islands with the departure of Allied troops from the Solomons. The myth of the coming of the cargo was again a central feature, combined with demands for high wages, education and even political independence. When military drilling and the exaction of monetary contributions followed, the Administration attempted to suppress the movement. However, the cult persisted into the early 1950s, becoming proto-nationalist in form.

Numerous attempts have been made to formulate a general explanation for cargo cults. The approach of C. S. Belshaw deserves comment, for he maintains that similarities between cults are directly due to a common element in the conditions in which they flourish. Common features that occur in widely separated areas are the "cargo myth, hysteria, rapidity of climax, dreams and second sight, and a mixture of traditional legend and biblical characters" ("Recent History of Mekeo Society", *Oceania*, XII, 1, Sydney, 1951, p. 7). Other common features noticed by several observers have been summarised by Berndt (p. 152). Thus there is an underlying idea that all trade goods have been manufactured in the spirit world by ancestors as gifts for their descendants, but they have been misappropriated by the white man. A cargo of European goods is to be brought by the ancestors, and its arrival will provide the natives with the means of power equal to that of the white man. Associated with these ideas is the common belief in the disappearance of the white man and his rule, prophecies, mass demonstrations, convulsive twitching occur and wish fulfilment or achievement by fantasy is commonly expressed through the use of European symbolism. Frequently movements continue well after the non-arrival of the cargo or of ancestors on the appointed day. Most cults are led by men of unusual personality, who often stand to gain in status or wealth through the movement, although these are only

[1] Much of the extensive literature on cargo cults is given in Ida Leeson, "Bibliography of Cargo Cults and other Nativistic Movements in the South Pacific", *South Pacific Commission, Technical Paper* No. 30, Sydney, 1952.

secondary motives. The medium commonly claims to have been given a sacred order or charter by the spirits.

In considering the various explanations that have been attempted, it now seems clear that interpretations based merely on single causes are inadequate in themselves. Thus while Max Weber's "theory of charisma" sheds light on one significant aspect of cults as a form of social action, it leaves unexplained many common manifestations. Many prophets are indeed "charismatic leaders" who are "set apart from ordinary men and treated as endowed with supernatural, superhuman, or at least specifically exceptional powers or qualities" (*The Theory of Social and Economic Organisation*, London, 1947, p. 329). But since leaders are only thrown up by certain social conditions, their function hardly appears to be basic in the whole movement, even though it might be agreed that charisma "is a phenomenon typical of prophetic religious movements or of expansive political movements in their early stages". It is rather in these social and economic conditions—the seedbed in which cults grow—that the true causes of cargo cults must be sought.

In the same way, attempts to use exclusively Ralph Linton's theory of "nativistic movements" appear to be inadequate, although his approach seems to be one of the most illuminating ("Nativistic Movements", *American Anthropologist*, 45, 1, Menasa, 1943, pp. 230–40). A "nativistic movement" is any conscious attempt on the part of a society's members to revive or perpetuate selected aspects of its culture. In many cargo cults revivalism is evident in attempts to destroy European property and restore the old way of life, or at least cherished features of it banned by the missionaries. Such a nativistic, or "contra-acculturative" viewpoint has been taken by M. J. Herskovits in describing movements " . . . wherein a people come to stress the values in aboriginal ways of life, and to move aggressively, either actually or in fantasy toward the restoration of these ways, even in the face of obvious evidence of their impotence to throw off the power that restricts them" (*Man and His Works*, New York, 1949, p. 531). But as Peter Worsley has stressed in *The Trumpet Shall Sound* (London, 1957), cargo cults are characteristically forward-looking as well as backward-looking, expressing expectations of supernatural bliss or material benefits that were no part of the traditional order.

Worsley focuses attention on the social and economic factors created by the conditions of contact and presents an historical analysis in Marxist terms of "activist", "millenarian" movements—i.e., ones in which people actively prepare themselves for the "Day". He stresses the vagaries of the European economy as significant in undermining the natives' confidence in rational activity, creating frustrations and sapping their morale. The phenomenal fluctuations in the price of copra in the inter-war period are thus seen to be a prime factor in engendering social crisis. W. E. H. Stanner had earlier noted the natives' disenchantment with the European economy due to the unfavourable colonial terms of trade and the repatriation of savings and net profits by European enterprise: "A simple calculation of New Guinea imports as a proportion of the value of exports shows a marked *downward* trend between 1920–40" (*The South Seas in Transition*, Sydney, 1953, p. 73). Worsley also emphasises native ignorance of the processes of factory production; since the whites' material wealth was clearly not produced by the few missionaries and patrol officers, its acquisition seemed to be due to the possession of some secret magical power. Added to these factors were conditions of economic uncertainty and instability resulting from diminishing crop production as more and more of the young men abandoned village

gardens to become indentured labourers on the European-operated mines and plantations. Thus in the Taro cult, horticulture, which was the central economic activity of the people acquired a special economic significance "as epitomizing the maintenance of the well-being and viability of the society as a whole". Furthermore, Melanesians began to feel that real education was being withheld from them, thus placing "special emphasis in cult-programmes upon obtaining the 'secret' which the White man was concealing". This provides Worsley with further grounds for refuting views which see in cults "nothing more than an atavistic rejection of European culture".

Social and economic aspirations for the power and riches of the white man are thus cast in a religious mould. The hysterical phenomena of cults are seen to be " . . . the product of the ambivalent attitudes and feelings of men torn between hatred of the White people who had destroyed the old way of life and who now dominated them by force, and the desire to obtain for themselves the possessions of these very Whites". The force of the economic motive is certainly great, but it has been noted by Raymond Firth that this is linked with communication facilities. A rapid increase of these facilities almost inevitably leads to a rapid expansion of wants" ("The Theory of 'Cargo' Cults: A Note on Tikopia", *Man*, LV, London, Sept. 1955, p. 130). The generation of new needs is probably less effective than the existence of a markedly uneven relation between a system of wants and the means of satisfaction. Worsley in general concludes that the powerful emotions evident in cults express a " . . . desperation growing out of their ambivalent attitude toward European culture, their confusion at the queer fluctuations of the European-imposed order, and the frustration of their growing wants at a time when higher production and harder work often brought only diminishing returns" (pp. 44–45).

Worsley's economic interpretation is convincing, and on the whole, his attempt at a unified general explanation is successful. There are times, however, when he has considerable recourse to aspects of other general explanations to validate his conclusions. While Judy Inglis' attempt to isolate factors that are not only common but also peculiar to all cult-situations is perhaps a better method ("Cargo Cults: The Problem of Explanation", *Oceania*, XXVII, 4, Sydney, June 1957, pp. 249–63, and "Interpretation of Cargo Cults—Comments", *Oceania* XXX, 2, December 1959), one may note that a particular set of factors in one culture-contact situation can trigger off a cult, while a very similar set in another situation may not do so. To this reviewer at least the difference seems to lie possibly in functional relationships between integral elements of culture, and, in particular, in the manner in which revolutionary changes in values and attitudes affect other focal elements of culture.

The proliferation of cults in Melanesia seems to be explained by Belshaw by his belief that cults thrive in "half-way" (or perhaps "quarter-way") communities, although Guiart, Berndt, Firth and others oppose this view, noting that cults have occurred among societies at the earliest stages of culture-contact, and also among Christians of long standing. Certainly the impact of the West has generally destroyed those mechanisms that resolved internal forces of dissension—the "peace in the feud" that Max Gluckman has noted in African societies (*Custom and Conflict in Africa*, Oxford, 1955). Worsley holds that they occur in the main in relatively "primitive" "stateless societies" where people live in small, isolated social units. Cults thus serve as an institutional integrating force to a people in need of political institutions. If this is true, one can agree with Guiart in conceiving of some cults at least (e.g., Masinga Rule) as "forerunners of Melanesian nationalism" (*Oceania*, XXII, 2, Sydney, Dec. 1951, pp. 81–90).

R. F. WATTERS

POST-WAR MIGRATION TO AUSTRALIA

The various aspects of post-war immigration into Australia have been analysed by many writers in both Australian and overseas journals. This is not surprising as this immigration has involved the movement of one and a half million people (to the end of 1959), and has greatly influenced the economic, social, political, demographic and religious structure of Australia.

C. A. Price, writing on "The Effects of Post-war Immigration on the Growth of Population, Ethnic Composition and Religious Structure of Australia" (*The Australian Quarterly*, 29, 4, December 1957, Sydney, pp. 28–41), claims that Australian migration statistics are among the best in the world but stresses that there are several important gaps in the migration records. The statistics conform to the international usage of terms, such as "permanent arrivals", "net migration", etc., adopted by the International Conference of Migration Statisticians in Geneva in 1932. It is, however, unfortunate that the terms as thus officially defined make it impossible to determine how many of the "permanent arrivals" are Australians returning after trips abroad, visitors who intend to stay a year or so and then depart, or persons who intend to settle in Australia. Likewise, it is impossible to discover from these internationally recognised terms how many of the persons who landed in Australia intending to settle have later changed their minds and left again. Further, since the classification "British Nationality" includes not only persons of British origin but also Maltese, Cypriots, Asians of British nationality, persons of alien birth who acquired British nationality before migrating to Australia, and others, it is impossible to separate persons born in Britain from those of British nationality. In view of the importance of the ethnic composition of immigration, this is a serious deficiency. Data on the religion of the migrants is also inadequate. Price examines these gaps in detail, and tries to fill them with material from other sources, especially the full tables of the Census of 1954.

Using very ingenious methods, Price estimates how many "new settlers" have come to Australia. There is no easy way of finding out the number of really new permanent arrivals from the statistics of permanent arrivals, net permanent migration, or net total migration; an additional difficulty lies in the international definition of "permanent departures". Price comes to the conclusion that about fourteen per cent of the migrants ("permanent arrivals") are not new settlers—i.e., not permanent additions to the Australian population—so that, at the time of the much celebrated arrival of the millionth migrant in October 1955, Australia had actually received about 860,000 genuine new settlers. Another of Price's findings was that the British proportion in the total number of settlers that Australia has succeeded in keeping is slightly less than thirty-four per cent as compared with the usually quoted figure of 47.4 per cent derived from the nationality statistics of "permanent arrivals".

Analysis of the religious affiliations of Australia's post-war settlers suggests that in the intercensal years (1947–1954) the proportion of Roman Catholics amongst new settlers (forty per cent) was nearly twice as high as the proportion in the total Australian population in 1947, and that of the Lutherans about five times as high.

Price concludes his penetrating study by stating that "it is quite time that Australia supplemented the somewhat inadequate international conventions now in force so that persons interested could make an accurate assessment of the position concerning new settlers without having to adopt the roundabout methods used in this article".

The emphasis is on economic aspects of immigration in Part Two of E. J. Donath's article on "Australia's Population: A Demographic-Economic Study" (*The Australian Accountancy Student*, July 1958, pp. 82–87). After a brief

survey of the part immigration has played in the demographic history of Australia, detailed figures are given of the post-war decade, and some industries in which the immigrant labour force has been especially high are discussed. Immigration's influence upon inflation, balance of payments difficulties, shortage of housing and educational problems are discussed; it is estimated that Australia saved the sum of £3,000 million for feeding, clothing, rearing and training to working age the 600,000 adult migrant workers who joined the Australian work force. The distribution of migrants among the States is also discussed, as well as the "bachelor problem" caused by the disparity in sexes among the migrants; 160,000 more male than female migrants came to Australia.

The distribution patterns in Australia of "New Australians", i.e., immigrants of continental European and Maltese origin, are discussed by A. J. Rose in his article on "The Geographical Pattern of European Immigration in Australia" (*Geographical Review*, 48, 2, October 1958, New York, pp. 512–528). The discussion is based on the "Country of birth" data in the Australian census of 1954, and Rose comes to the conclusion "That although the general pattern of distribution of immigrants tends to follow the general Australian pattern rather closely, there are many variations". His study is supported by four tables and eight maps. After discussing in general terms the factors influencing the geographical distribution of immigrant groups, Rose points out how, in the settlement of Europeans in Australia, these general considerations have been modified by a number of specific factors, but "the dominant specific factor in the location of immigrants has been neither the direction nor restriction but the positive force of economic attraction arising from new openings in an expanding economy characterised by a general and rather persistent labour shortage . . . the principal immigrant concentrations correspond rather closely with the industrial areas in the state capitals, other cities, and regions with large-scale public works". In Australia as in other immigration countries migrants show a distinct tendency to settle differentially in certain kinds of environment. Rose discusses at length the settlement of migrants in the four habitats recognised in Australia: Capital cities, Industrial cities, Country towns, and Rural areas. The Maltese, for instance, seem to concentrate in small, clearly defined, areas and are clustered most densely in Sydney and Melbourne, which together contain seventy-two per cent of the Maltese-born living in Australia. On a broader scale, a striking feature is the high concentration of migrants in two rural areas. The first is the Cairns division of North Queensland, the main sugar-cane growing area of Australia; in this small district are twenty-five per cent of all migrants living in Queensland, constituting over thirteen per cent of the population. The district has been termed "Little Italy" for 9,000 of the 13,000 migrants are Italians. The second rural area consists of the alpine regions in the southern part of Australia where irrigation and hydro-electric development have attracted men of many nationalities (Snowy Mountains, Bogong High Plains, Tasmania). Rose also discusses briefly the demographic, economic and social impact of immigration, concluding: "Although it is commonplace among Australians to condemn the immigrants on the score of undue city orientation, it is noteworthy that the immigrants are simply following the pattern set over many decades by native-born Australians themselves. And two of the most numerous groups, the Italians and Dutch, prefer the rural habitat to a greater extent than the Australians do."

The influence of immigration on population structure, industrial work force and industrial expansion has been analysed by E. R. Woolmington ("Post-War Immigration and Industrial Development in Australia", *The Australian Quarterly*, 30, 1, March 1958, Sydney, pp. 77–89). He comes to the conclusion that "The immigrant contribution, and particularly that of the new non-British element, to Australia's post-war industrial expansion has been a critical one . . . the influx of

Continental Europeans especially has materially assisted Australian workers in their search for better conditions by enabling more of them to select the more comfortable—and perhaps more profitable—occupations more easily than would otherwise have been the case."

Woolmington discusses those industries in which immigrants, especially non-British migrants, tend to find employment easily, and those where immigrants' penetration is substantially lacking. "To a degree, this is a consequence of government policy, where immigrants, particularly the government-assisted ones who constitute the great majority, have been recruited with specific regard to the needs of expanding basic industries." Of the 9,000 workers of the Port Kembla steel-works, for instance, forty-one per cent were post-war migrants, and thirty-five per cent were non-British. Thus resulted an unequal distribution of migrants between the basic or "dirty", and the less unpleasant or "soft" industries; the British immigrants for a number of reasons tend to follow the Australian pattern. The most significant influence upon the age structure was that about two-thirds of the post-war expansion of the Australian work force was due to immigration. Woolmington to a certain extent goes over the aspects discussed by Price in his above-mentioned article; however, the uneven distribution of British migrants, Continental migrants and native-born Australians among the various branches of manufacturing is properly stressed. Unfortunately, no attempt was made to discuss the extent to which some nationalities have penetrated certain branches of Australia's tertiary industries, apart from the well-known predominance of Greeks and Italians in the fruiterer and restaurant trades.

A. J. Rose's study of "Some Social Aspects of Australia's Immigrant Population" (*The Australian Quarterly*, 30, 3, September 1958, Sydney, pp. 56–71) covers much of the ground discussed by earlier writers. His investigation of the marriage patterns of migrants, however, represents an original contribution to the literature on immigrant communities. His analysis of co-national marriage, inter-marriage with Australians, and marriages among new Australians of different nationality shows clearly that "it is dangerous to generalise about the social behaviour of any immigrant group in general. Thus, although the Netherlanders are geographically the most dispersed of all the groups, they have a relatively high rate of co-marriage. Czechoslovakians, on the other hand, marry fellow-nationals to a lesser degree than other Eastern Europeans, yet they cluster to a greater extent than any other East European group apart from the Ukrainians. Most consistent of all are the Southern Europeans, who in general couple a high degree of clustering with a marked tendency to co-marry. But even here the matter is not clear-cut. The Greeks cluster to a greater extent than the Italians, but their womenfolk do not marry fellow-nationals to nearly the extent of Italian women. The same applies to Maltese." Perhaps the most important discovery was the great extent of marriages between New Australians of different nationality. This feature demonstrates again the resistance of native-born Australians to association with New Australians; to a certain extent, unfortunately, our New Australian migrants are forced to form one single community distinct from the Australian and the British. Rose's study shows clearly that the assimilation process which Australian's often demand very forcibly is to a large extent slowed down by the attitude of the native-born Australians towards the immigrants, especially the non-British. Mrs J. Hammet of the Mental Hygiene Authority in Victoria, discusses "Migrant Adjustment and Personal Identity" (*The Australian Quarterly*, 31, 2, June 1959, Sydney, pp. 40–49) in an original and searching Investigation of assimilation as a problem of personal identity. Her findings based on Australian experience should be of great importance to any immigration country which demands quick assimilation: quite refreshing is her questioning of a special

"Australian way of life", and of the presumption that "the Australian pattern of human decency must be infinitely superior to any other pattern".

Practically all students of Australian immigration have come to the conclusion that it has been a great success from the economic point of view; one and a half million migrants have been absorbed into the economic life of the country without any serious difficulties. It is, however, very doubtful whether they have been assimilated into the Australian community as a whole. The often-heard demand of "assimilation in one generation" is obviously unreasonable and impossible to attain; such a demand, indeed, might spoil the chance of assimilation for the second generation.

E. J. DONATH

THE MAORI IN TOWN AND COUNTRY

A group of Maoris and Pakehas were once discussing the changes that seemed necessary if Maoris were to make the best use of their resources and opportunities. Listening to them was an elderly Maori woman who exclaimed feelingly at one point, "Why must it always be the Maori who changes?" To her it seemed that the Pakeha was "sitting pretty" and asserting that the Maori's only chance was to be more like him. In the course of her life this woman had successfully adapted herself to new conditions, but she had grown tired of the continual demand for further change.

That the Pakeha himself may sometimes be appalled at the sweeping changes coming over his own society may not be obvious to the Maori upon whom the need for re-adjustment is being continually impressed. The world in which the Maori lives is so different from that of his parents and grandparents, his cherished values are so frequently called into question that it is no wonder that many, like this woman, long for a stability that has been denied them.

Ernest Beaglehole ("The Maori in New Zealand", *International Labour Review*, LXXVI, 2, Geneva, August 1957) has given a useful general survey of the Maori adjustment to a dominantly European type of society, and shows that, in spite of many setbacks, the relationship between Maoris and Europeans in New Zealand is now to a considerable degree marked by justice and goodwill. He points out that in broad terms the choice facing Maoris is between assimilation, with a complete loss of Maori culture as such, and integration, by which he means a situation where the two cultures remain distinct although Maoris may participate fully in the national economy and the political life of the country. Like many others, the woman who was weary of change would undoubtedly choose the path of integration as it would leave her the comfort she finds in the activities and institutions derived from her Maori culture.

The extent to which the European economy dominates the lives of Maoris, even though they live in a remote bush settlement long isolated from European contact, is shown by John McCreary and John Rangihau (*Parents and Children of Ruatahuna*, School of Social Science, Victoria University of Wellington, 1958). For the people of Ruatahuna complete assimilation is not likely to occur for many years. Their community is made up almost entirely of Maoris and for them the question is one of how the values implicit in their native culture can

be modified so that the optimum good can be gained from their present economic opportunities. Still relatively isolated, they probably have as good a chance as any community to develop a modern Maori culture. One of the conclusions reached by these authors could, however, apply equally well to many other settlements, particularly in East Coast districts and in North Auckland. They write on page 13, "From the comments of people themselves, then, we can conclude that there is a group who would like to see their children stay in the valley, not only because they dislike breaking up a family but also because they feel there are positive advantages in living in Ruatahuna." The advantages referred to were almost all associated with the values enshrined in their own Maori culture.

For many communities besides Ruatahuna it is obvious that only a small proportion of the children now growing up can hope to spend their working lives in their childhood homes. We know that many of them, when they move, will carry with them some of the practices of their home people and will join with their kin or with other Maoris in perpetuating many of their cultural institutions. This has been true even of those who find themselves in the cities. It is plain, though, that on first experience of the new environment many Maoris pass through a period of considerable confusion. From studies of Maori crime it seems that the person who has lost his footing in one culture without finding it in the other, who is not certain of his own cultural status, is more likely to fall into crime than is the person who accepts more fully either the Maori or the European way of life. Making a decision between assimilation and integration may be quite an urgent task for Maoris settling themselves in a new community.

The June 1959 issue of *Te Ao Hou* (No. 27, Special Auckland Issue, The Department of Maori Affairs, Wellington) gives a vivid impression of some of these difficulties and of the successes of Maoris who have made a new home for themselves in New Zealand's largest city. Roi te Punga, himself a Maori who has proved his ability in a responsible administrative post, discusses some aspects of Maori crime in Auckland. It is apparent that unfamiliarity with the city situation, or a lack of standards applicable to this situation, is an important factor in the genesis of Maori offences. Other articles in the same issue make it plain that Maoris migrating to Auckland will face many difficulties in finding suitable accommodation and employment and in making those changes in their pattern of living that are demanded by the urban environment. *Te Ao Hou* also gives an account of some of the institutions—clubs, the community centre, church groups, etc.—through which many city Maoris retain a link with their own culture.

The members of these groups are Maoris who, even in the city environment, have chosen the way of integration because they feel that Maori culture has something of value for them. There are hundreds of others, however, who have only rare contact with any Maori organisation. Some have deliberately chosen to adopt European ways, but many, especially new arrivals, find themselves profoundly disturbed by the conflict between the attitudes and habits they have learnt at home and the new ways of acting that are demanded by the new environment. Added to this personal problem are the commonly encountered difficulties of poor housing, low educational standards, a preponderance of unskilled work, low incomes and big family obligations which accentuate the differences between Maori and European. These external difficulties are formidable, but it is doubtful whether any individual Maori's efforts to cope with them can meet with success unless he has resolved his personal uncertainties. This he can only do by working out a routine decision-making process which

will determine where he stands in relation to the two cultures to which he is exposed. Each individual and each community must find a way to remove the conflict generated by their meeting. Failure to do this leads to uncertainty, apathy and the disorganisation of both personality and community.

Disorganisation, expressed in high crime rates, high accident rates, low educational achievement, apathy and so on has become more obvious through the growth of the Maori population, its increasing mobility and the close contact between Maori and Pakeha. Because of the difficulties met by Maoris in a dominantly European society the government long ago set up a special agency, the Department of Maori Affairs, with the intention of reducing the effects of disorganisation by increasing the Maori's participation in the wider New Zealand life that is open to him. Beaglehole describes the Department as a "mediating institution" and this aspect of its function is taken up in the Department's annual report for 1959 (*Report of the Board of Maori Affairs*, Government Printer, Wellington, March 1959) which states that the Department's purpose is "to remove the obstacles that may still hinder the Maori people from achieving full social and economic equality with the Europeans" (p. 15).

Ruatahuna and Auckland are extreme cases of the two different situations in which the Department of Maori Affairs is called upon to exercise its mediating function. In Ruatahuna, the Department deals with a traditional society undergoing modification through the impact of selected elements of European culture. The techniques of community development are appropriate in such a case. In Auckland, on the other hand, the Maori migrant has to adapt himself to a society in which European values dominate the greater part of his day. The Department's task here is one of re-settlement or re-location, mediating between the unprepared individual and his unfamiliar environment. The problem is to help the individual to decide where he stands in relation to both European and Maori culture, to help him choose between assimilation or various degrees of integration.

How far the Maori Affairs Department sees its work as either community development in the established Maori communities or as re-settlement in the communities that Maoris are moving into is difficult to tell from reading its report. The report indicates the extent to which Maori land is being developed and the number of houses that have been built, but one cannot tell how far the work is accepted as essentially social in character, as a mediation between a people and their environment. Whether conceived in such terms rather than in terms of the physical tasks involved will have considerable bearing on its policy and on the effectiveness of the Department's efforts.

The problems of the Maori people, and especially of those moving out from their rural homelands, are certainly not growing any less. In the field of housing alone the Department acknowledges its inability to do as much as is needed. In this, as well as in other fields such as education and employment, the situation is likely to become increasingly difficult. In the final contribution to *Anthropology in the South Seas* (essays presented to H. D. Skinner, ed. by J. D. Freeman and W. R. Geddes, published by Thomas Avery and Sons, New Plymouth, 1959) Bortie points out, "Where there were 11,000 young Maoris entering the employable age groups, fifteen to nineteen, ten years ago, there are 16,000 today, and there will be 22,000 in ten years' time and 40,000 twenty years hence" (p. 262). Any agency offering its services as a mediator between these people and an environment that will still be strange to many of them will need to have a clear concept of the problems that it is facing and great skill in using the means it has to hand for dealing with them.

It has always been noticeable that the majority of Maoris and part-Maoris choose to retain those elements of their culture which do not conflict too seriously with the necessity of making a living in New Zealand's European-style economy. No doubt the choice for many will continue to be integration rather than assimilation. Like the woman who objected to the continual pressure of change, many Maoris in the cities and elsewhere will wish to return occasionally to their own particular Ruatahuna and to bring something of Ruatahuna into a corner of their city.

J. BOOTH

Geographical Reviews

DAMS, DYKES AND DESPOTISMS

Karl A. Wittfogel, *Oriental Despotism,* Yale University Press, New Haven, 1957, pp. 556, $7.50 (60s.).

It is now over two hundred years ago since historians began to discover that the processes of history are not wholly determined either by man's rational ambitions or by God's omniscient providence; and that in describing them, due attention must be paid to a vast number of very irrational elements, including economic and geographical factors that far transcend the importance of individual wills. With this insight, history became a truly empirical study. Unfortunately the pendulum soon began to swing to the opposite extreme, to historicism, and some enthusiastic historians thought that the study of history could now best be carried on if one focused one's attention exclusively upon the framework of these non-human elements and considered individuals themselves merely as the playthings of vast, biological, economic, social or geographical forces. With little empirical study large-scale frameworks were conceived and human history was described as wholly determined by these general factors, and therefore easily predictable. It was this notion of prediction that lent such enterprises a pseudo-scientific respectability—for science is supposed to be able to predict. In fact, such enterprises are based upon a complete misconception of the nature of scientific prediction, and at the present time, where we have both Karl Popper's *Poverty of Historicism* and a large number of very critical appraisals of Toynbee, there is no need to say much about this matter. The book under review, however, is a staggering *reductio ad absurdum* of this whole approach to history, and should do more to discredit historicism than many critical comments.

The author has written an account of Asian forms of government and he has based his analysis upon two very old and very reputable conceptions. The first is that in an area where survival depends upon large-scale irrigation, the state must develop into a fairly totalitarian and despotic enterprise and that in such areas there is little chance for an urban middle-class to develop independent economic enterprises and the social institutions that go with them. The result must be an oriental despotism. The idea goes back to Montesquieu and has rightly been repeated in one form or another ever since. The second conception is that the freedom we enjoy in our modern democratic societies is not based upon an abstract faith in freedom, but upon a balance of power in our societies between state, business interests, labour interests, regional interests, etc. Where there are many powers, no one can tyrannically impose his will on all and everybody will enjoy a certain measure of freedom. This again is an old and honourable insight, known to all readers of Burke, and it was the great merit of Toque-

ville that he warned us that the social revolutions of the nineteenth century might easily result in upsetting this balance of power even in societies that are industrialised and do not depend upon large-scale irrigation works. He realised that, in the name of freedom, states might emerge that are more or less totalitarian and orientally despotic even though they rule industrial societies. The next possible stage for an inquiry might have been an attempt to find the similarities between large-scale irrigation enterprises, notoriously creating totalitarian despotism, and large-scale industrial enterprises, creating social conditions conducive to totalitarian developments. If totalitarian power develops in many parts of Asia this is as likely to be due to a progressive industrialisation which will produce a western type of urban proletariat, as to the persistence of traditions created by the pre-industrial hydraulic societies.

The book under review is, however, not concerned with any such fruitful empirical investigation. The author has instead preferred to illustrate with a wealth of learning how large-scale irrigation schemes give rise to despotism and impede the development of a freedom-treasuring middle class. The book contains some useful historical descriptions of such processes in China and India and some other countries, but there is nothing in it which challenges fundamentally our established views, even though the author's sociological concepts often throw some light on well known historical developments. The point is, however, that of the 500 pages of the book, well over 100 are taken up not with history and sociology but with an attempt to examine the truth of what Marx, Engels and Lenin said on these matters. To Marxist fundamentalists this is no doubt of great importance. But to those that do not have a compulsive fixation upon Marxist doctrine, a few footnotes might have sufficed and, moreover, they would have welcomed some critical words upon the views of non-Marxist authors who have in the past struggled with this problem.

Be this as it may. The intelligent reader must of necessity ask what the point in this whole description is. The author obviously hates totalitarianisms of all kinds, and one cannot but share his antagonism. But this antagonism seems to deprive the book of its point. The argument is based throughout on the historicist assumption that individual ambitions and plans do not matter and that human beings are living their lives in a framework of geographical and economic determinants. Why, then, does the author write as if oriental despotism were something wicked or dishonest? Given the economic and geographical conditions of China and ancient India, on his own assumptions, nothing but oriental despotism could have emerged there. What then is wrong-headed about it? Furthermore, why does he warn us of oriental despotism in the West? On his own assumptions we are safe as long as we do not live by the establishment of large-scale irrigation schemes. All we need to do is to continue industrial enterprise and have towns and there will be no despotism.

The author, of course, knows perfectly well that all this is absurd. There *can* be despotism without large-scale irrigation works. Furthermore, even despotism with large-scale irrigation works is mitigated by human frailty, for no one class of rulers is super-efficient and omniscient, and a certain degree of individual freedom has survived even in Indian and Chinese villages. Natural inroads upon oriental despotism are made by the growth of industry and urban society in Russia, China and India, and as the urban societies in these countries prosper, they will create more room for individual freedom, provided, of course, the urban proletariats are not organised to support the growth of the occidental form of despotism known as fascism. In other words, everything is open, everything can change, and there is no telling how and when.

The historical inquiry to be found in the present book is, however, not likely to throw much light on these questions. For, faithful to traditional historicism,

the author plays fast and loose with the evidence, selects facts with an arbitrary ruthlessness which is itself a form of methodological "oriental despotism". The argument ranges over a wide field and I cannot presume to do more than test it in a case with which I am familiar. The author is so obsessed with the fact that despotism stems from hydraulic societies that he feels obliged to insist that William the Conqueror's Domesday Book, imposed by the Normans upon a non-hydraulic society, must, as an example of despotism, have been due to eastern influences (p. 213). It is questionable whether the Domesday inquiry should be called despotic and it is equally questionable whether the inquisition owed much to Norman experiences in the Mediterranean and their contacts with oriental despotism. At any rate, Saracen rule in Sicily (which the Normans knew best) was, though despotic, notoriously and lamentably unhydraulic. But there is one thing that is most certainly *not* questionable. Domesday Book, whether despotic or not, gave to English feudalism the very twist that made possible the growth of institutions that were feudal and monarchical at the same time. Both parliamentary government and the rule of law are unthinkable without these medieval institutions and we have here at least one case where a despotic inquisition directly contributed to the growth of freedom. One only needs to look at those areas in Europe where there was no Domesday Book: in Italy, for example, feudalism and city life developed like weeds and there the absence of a feudal monarchy helped to generate one attempt at tyranny after another. There was nothing very hydraulic in medieval Italian society, whereas the society in which the author *does* detect the presence of hydraulic modes of tyranny is the one European society that has remained comparatively proof against the seductions of oriental despotism. To elucidate this matter fully would require, however, more detailed historical study than is compatible with the sweep of the historicist imagination.

Since the author presents the development of forms of government as determined by economic and geographical factors, one feels that he considers certain developments as inevitable. Asia can't help being subject to despotism; industrial societies do not get despotism, and so on. These conclusions are not true, of course. But even if they *were* true, they would plainly make the author's moral indignation at despotism logically absurd. He might as soon be morally indignant with God. They also deprive his fears that despotism might advance beyond irrigation areas (beyond hydraulic societies) of all logical foundation. The conclusion is therefore inevitable: the present book reduces the historicist method to absurdity. The author cannot have it both ways: if he is right, we need not worry about politics but only about whether we live by irrigation schemes or by industry; and then his warnings and moralisings are beside the point. And if his moral attitudes are not beside the point (and I am certain they are not!), his analysis is obviously faulty; for in that case there is both more and less to "Oriental Despotism" than this stereotyped analysis reveals.

The author, however, does not address himself to his problem in such blatant moral terms but prefers to present the discussion as one about the nature of progress. He considers oriental despotism and the irrigation economics upon which it is based as a blind alley; and indulges in endless polemics against those Marxists that regard it as a mere stage in the evolution of mankind. Given the fact that the whole notion of progress is not capable of either theoretical or empirical elucidation, it becomes clear that the discussion is no more than an attempt to put a scientific cloak upon a number of value judgments. Marxists, the author seems to be saying, like oriental despotisms and consider them capable of further progress. The author, on the other hand, does not like them, and we must presume that he considers them to be among nature's waste products. (It is hard to imagine what he proposes to do with these enormous waste products.)

But even if one is willing to overlook the attempt to disguise moral judgments and to take the argument about progress at its face value, one cannot get very enthusiastic about it: for the battle which he and his Marxist opponents appear to be fighting is all fought on the esoteric ground of historicism and of Marxist pseudo-scientific sociology, and the reader who is wary of the pitfalls of Marxism and of other kinds of historicism will sooner or later wearily put the book aside because he can have no possible interest in its outcome.

PETER MUNZ

ASIA THROUGH AMERICAN EYES

Norton Ginsburg (Editor), *The Pattern of Asia*, Prentice-Hall, Inc., Englewood Cliffs, N.J., and Constable, London, 1958, pp. 929, 70s.

The pace of social and economic development in Asia during the last decade and the increasing volume of literature documenting this development is making it increasingly difficult for the lone scholar to present a full yet judiciously balanced picture of the Asian scene. A Joseph Spencer may succeed, by painting with broad and vigorous strokes, in conveying a vivid impression of this many-splendoured scene and, above all, of the emergence of the major cultures whose distinctive modelling of their environment give the continent so much of its richness. To achieve such a *tour de force*, however, much of the regional detail must be ruthlessly sacrificed; in consequence, while Spencer's volume is long likely to remain the essential work for the geographer or general reader who wants an understanding of the basic patterns of Asia, the student interested in the detail of these patterns must seek this elsewhere.

The volume under review attempts to provide such detail and "to illustrate the various problems and potentials of the countries of Asia". It is a co-operative work, broken into six major sections; each of the regional sections has been written by an acknowledged specialist with long and intimate first-hand knowledge of the region, or "realm", concerned. The advantage of such an approach is obvious; as rightly emphasised in the Preface, "it brings several points of view to bear on a multi-faceted Asia which cannot be regarded as a stamp from a single die". There are, also, obvious disadvantages, notably the difficulty of successfully integrating into a whole the several individual contributions and of ensuring the greatest possible degree of comparability between the various sections. The editor has attempted to overcome this difficulty by providing a general introduction based on the several points of view of the co-authors; above all, by the use of carefully-drawn maps and well-captioned photographic illustrations which give an admirable unity to the work. Nine hundred pages of text, thirty-six maps in the text and two endpaper maps, 161 excellent photos, bibliographies, an adequate index and a pleasing lay-out—all these, combined with the authority with which its contributors can speak, make it a fundamental volume for all geographers interested in the Asian scene.

Yet, in spite of all its admirable qualities and despite the painstaking five years of effort which have gone into its preparation, it remains in many respects an unsatisfying book. Partly this is because of the lack of balance between the systematic and regional sections, partly because of the rather anomalous allocation of space between the various major regions of the continent. Sixty-five pages out of 900 are devoted to a description of the physical and human background of Asia as a whole; of this total, forty-five pages, or one-twentieth of the volume, are concerned with the human geography of "Asian Asia". The treatment cannot but be superficial and, while it is true that the student can always turn to such works as *Asia East by South* for such background material, the advantages, in a text of this size, of a fuller discussion of the basic elements in the Asian scene

would have been very great. Such aspects as the pattern of diseases, population (including settlement forms, growth rates and cultural regions) and contrasts in levels of social and economic development might well have been included; against such a background the regional detail would emerge in sharper focus. And, since the volume is concerned with the "potentials of the countries of Asia" and "the processes of change which are radically transforming the Asian landscape", some treatment of political and economic systems in the introductory chapters would seem essential. The great contrasts between India and China in the pace of economic development and in the degree of transformation of their cultural landscapes results primarily from the contrasts in political systems and scales of values in these two countries, rather than from basically different resource endowments. To describe the role played by the Communist Party in China's resurgence does not necessarily imply any sympathy for the ideals it represents but it does help to explain both the pace of development in China and the logic behind the new patterns of industry and agriculture which are emerging.

This cautious avoidance of controversial or uncomfortable topics may help to explain the lack of balance also in the regional sections. The allocation of space to each major region becomes more meaningful if seen against population figures. Per ten millions of inhabitants the allocation of pages is as follows: Southwest Asia 30, Southeast Asia 9, Japan 8, Indian subcontinent 5, China 2; expressed in other terms, China's 600 million people, two-fifths the population of Asia, are crammed into one-sixth the area of the book. No one, and above all a New Zealander, coming from a country of less than three million inhabitants, would demand a strict allocation of space to countries on a purely population basis, nevertheless in the case of China, the actual and potential importance of the country in relation to Asia and the Pacific world is so great as to call for a much more generous allocation of space. It is noteworthy that, while the Soviet Union is excluded by definition from "Asian Asia", some sixty pages are devoted to the U.S.S.R. since, as the writers observe: "No discussion of the political and economic geography of the rest of the continent can help but return repeatedly to the political—and to a certain extent the cultural—influences that the Russian empire can and does bring to bear" (p. 22). Such considerations make the restricted treatment of Chinese development even harder to justify since China is tackling problems similar to those faced by the other countries of "Asian Asia" and not only is her experience more relevant to these countries than that of the U.S.S.R., but also the attraction of the solutions she is finding will be the greater. Indeed, a more realistic appraisal of the Asian situation might have suggested that the space occupied by the two chapters on the U.S.S.R. could more profitably have been devoted to a fuller treatment of the Chinese experiment.

As it is, the Chinese chapters are the weakest section of the volume. Largely this is the result of the intellectual quarantine into which China has been put by the West, which means that the majority of Western geographers have no first-hand knowledge of recent developments. Since it is fashionable to ignore official Chinese data the analysis must be based on either outmoded sources (of the sixteen references on "Industry and Commerce", given on p. 256, twelve deal with pre-1949 conditions), on official American digests of the Chinese press, or on superficially scientific analyses such as that of Rostow. The work of writers such as Adler or Fitzgerald is ignored. In consequence, the agricultural co-operatives are misleadingly described as "collective farms", agricultural poverty is said to be due to "an actual shortage of cropland" (p. 208) and little more than a page is devoted to the recent industrial revolution. In a bibliographical comment (pp. 256–7), the writer admits that earlier analyses may become invalid as a result of changed political conditions but adds: "Nevertheless, the practical operation of the Chinese economic system . . . has not altered as drastically as

might be supposed, and things are much the same in techniques, underproductivity and underdevelopment. The general pattern of resource availability and distribution remains much the same, so that the basic conditioning factors of development as described by pre-communist writers generally are still valid." It is to be hoped that by the time a second edition is being prepared the intellectual boycott of China will have been lifted sufficiently to permit a more realistic assessment of the Chinese achievements in eradicating the basic causes of poverty and in creating a pattern of economic development specifically adapted to the needs of the densely crowded lands of Monsoon Asia.

The reviewer shares the opinion of many economists that the poverty of peasant Asia is due not so much to the limitations of the physical environment as to institutional factors such as the defective organisation of peasant society. Similarly, the unsatisfying quality of parts of the volume under review might be attributed to deficiencies in the institutional framework—or the academic approach—within which analysis is carried on. The "basic understanding of the processes of change which are radically transforming the Asian landscape" which this work seeks to provide calls for an honest and detached examination of the interrelations of political change and the economic and social developments which are reshaping the cultural landscape of Asia. Such an examination is fundamental to an understanding of the continent's geography; it is no less basic to the formulation of realistic policies by the West. Unfortunately, as this volume shows, such objective analysis is one of the major casualties of the Cold War.

KEITH BUCHANAN

THE FIJIAN PEOPLE—ECONOMIC PROBLEMS AND PROSPECTS

A Report to the Fijian Government by O. H. K. Spate, M.A., Ph. D. (Council Paper, No. 13 of 1959 of the Legislative Council of Fiji.) Government Press, Suva, p. 112, 2s. 6d.

With an established reputation for loyalty and courage and with a highly developed traditional culture unusually resistant to external pressures, the Fijian people are held in high regard throughout the Commonwealth. The fact that Fijians were active participants in the recent riots and industrial strife in Suva appears to have come as an unwelcome surprise to many Europeans claiming some insight into Fijian affairs. It is to be hoped that this outburst of industrial unrest will not divert so much official attention to the immediate problems of urbanised Indians and Fijians that important aspects of Professor Spate's message pass unheeded.

Since it deals with the basic weakness in the economic structure of the Colony the Spate Report to the Fijian Government is a timely document of critical importance. More than four-fifths of the territory's rather limited land area are Fijian-owned and the small proportion of this land that is cultivated is usually used ineffectively so that the general welfare of the Colony suffers. The terms of reference for Professor Spate's enquiry required him to consider how far the Fijians' social organisation has acted as a limiting factor in their economic advancement. In addition to examining these factors and various aspects of Fijian custom responsible for the relative backwardness of this Pacific people, Professor Spate was required also to suggest changes for future administrative action.

In the main his survey is concerned with the agricultural and social activities of rural Fijians. Rather limited direct reference is made to the local wage structure, urban poverty, unemployment and other immediate causes of the recent industrial disturbances in the Colony. Nevertheless, all sections of the Spate Report deal with policies and situations directly and indirectly related to the

growing urban problems of the territory. As emphasised in recurring official statements, the low levels of wages available in Fiji reflect the Colony's low average standards of production. Among the causal factors operating, ineffective use of a very large proportion of the Fijian-owned land, combined with over-intensive cultivation of the inadequate areas leased to or owned by Indian farmers, are basic elements in the Colony's economic difficulties.

A most encouraging feature of the Report lies in the fact that the document arises from an official enquiry conducted by an independent investigator with exceptional qualifications for the complex and somewhat delicate task assigned to him. Readers of the Report who are interested in the problems of under-developed countries and in culture conflict situations will agree that Professor Spate has enhanced his considerable reputation in this field of investigation. Although the Report covers a complex situation in considerable detail it is a lively and interesting document with wide appeal for the general reader of Pacific Islands topics as well as for those more especially interested in Fiji or in the socio-economic situation so skilfully analysed. Many will appreciate the deft, light touches and the apt quotations which spice the exposition. Those with personal experience in Fiji and some knowledge of past policies and happenings in the Fijian Administration will be impressed and, in some instances, delighted with the tact and logic of Professor Spate's case for a new deal for enterprising and industrious Fijian producers irrespective of their relationship with the so-called "communal system".

The Report is based on extensive field work, including visits to fifty-two villages scattered throughout the territory. The investigation examines all important aspects of the Fijians' way of life, including land ownership and land tenure problems, the impact of communal and customary obligations on economic activities, the special difficulties of Fijians in monetary and contractual relationships and the housing situation in village and urban communities. The work of all administrative agencies affecting Fijians is examined critcally and in detail, since the task proceeded with the full co-operation of the officials directly concerned. The investigation includes a special study of the economic achievements of Fijians working collectively through the communal system as well as the successes and failures of independent Fijian farmers known locally as *galalâ*. The whole survey is exceptionally frank and lucid. It is always constructive, and in accordance with the author's stated intention it rejects "the careful silence and agile verbal straddle" that are unhelpful contributions to such important but clouded issues.

The main finding of the Report is that the future of the Fijian people lies in turning away from communalism towards individualism in economic affairs. Among other things this would involve a great change in the attitudes of Fijian Administration officials and the hierarchy of chiefs towards the *galala*. During the Second World War enterprising Fijians were encouraged to establish themselves as independent farmers as a special measure to increase the output of local produce. This policy was reversed early in the post-war years and since then, at best, the *galala* have been merely tolerated. Under existing conditions Fijians seeking exemption from village obligations to become *galala* tend to run counter to the policy of the Fijian Administration, which during recent years has been to promote the economic and social advancement of the Fijian through communal activities. The granting of these exemptions is at the discretion of local officials and subject to annual review. *Galala* status is circumscribed by quite stringent conditions, including a requirement that each independent farmer must manage his holding to make a gross income of not less than £100 per year.

Various sections of the Spate Report examine the Administration's highly paternalistic and centralised control of the social and economic activities of the Fijian people. The achievements of the compulsory Fijian Development Fund and

of other agencies such as the Fijian Banana Venture and the recently appointed Economic Development Officers are reviewed and commended. Various village projects that have succeeded under exceptional local leadership are examined for policy guidance. On the evidence before him Professor Spate concludes that the authoritarian procedures and multiplicity of regulations controlling all activities of the Fijian people have given rise to a number of special problems in village life, among which general frustration and repressive bureaucracy are conspicuous. In the words of the Report: "In the Fijian village very little, or nothing, can be done in the way of social or economic activity—not even, in theory, the holding of a dance—without the support, or at least the tacit approval of the Fijian Administration . . ." (p. 31). In Fiji, as elsewhere, excessive controls result in widespread evasion and, quite generally, nominal rather than actual compliance with the regulations is condoned. In theory, rather than in practice, a very large part of the daily round in the rural villages is controlled by preordained Programmes of Work and other rules that are given legal sanction by Fijian Regulations. It is not surprising that Professor Spate sees no promising economic future for the Fijian community whilst individual enterprise and local leadership are so often suppressed or discouraged by policy measures of a defensive character designed to protect the traditional "Fijian Way of Life". Regulations do not confine the dynamic energies of the other races in the Colony within the narrow limitations of a communal system and authoritarian "Programmes of Work" which have ceased to meet the needs of the times. It is somewhat surprising, however, that the detailed recommendations in the Report suggest relatively minor modifications in the administrative field to implement the important basic reforms so effectively advocated.

V. D. STACE

"EPPUR SI MUOVE . . ."

Charles F. Richter, *Elementary Seismology*, W. H. Freeman and Company Inc., San Francisco, 1958, pp. 768, £5 2s.

Hugo Benioff, "Circum-Pacific Tectonics", *Publications of the Dominion Observatory*, Ottawa, XX, 2, 1958, pp. 395–402.

G. A. Eiby, *Earthquakes*, Frederick Muller Ltd., London, 1957, pp. 168, 21s.

"And yet it moves," legend makes Galileo say, and for the last thirty years literature has been accumulating on the tectonically active landscape of New Zealand so that the New Zealander no longer has to whisper these words under his breath, as Galileo was reputed to have done. The dominance of horizontal faulting (transcurrent or strike-slip faulting) and the secondary nature of the vertical component of movement which initiates relief have now been traced around the Pacific and the detailed picture of local movements can now be fitted into a world-wide pattern. Discussion of these movements appears in two works of a general nature concerning earthquakes.

The first, Charles F. Richter's *Elementary Seismology*, is one of the most welcome books to appear on the table of the lecturer in physical geography for a long time. The word "elementary" is as seen from the author's viewpoint and the book is by no means elementary as seen by the non-seismologist. Richter discusses, in Chapter 27, California and New Zealand as areas where Pacific margin structure is best known in detail, and draws interesting comparisons.

In both regions a band of great active transcurrent faults traverses the country parallel to the margin of the structural unit of the Pacific. In New Zealand faults cut across river terraces whose post-glacial age is becoming more accurately dated, and Wellman (references in Richter) has shown that the displacement

along these faults is roughly proportional to the age of the terraces as shown by their downcutting. The great transcurrent faults move in a clockwise sense at a rate which can be estimated at about an inch a year. Accumulation of such strain is normally relieved by fault activity which produces earthquakes. Wellman's suggestion of movement along the Alpine Fault which runs from the north-central to the south west of the South Island of over 300 miles since the Mesozoic is of the same order as the present rate of drift and in the same sense, and is one of the same order as movement suggested for the San Andreas fault of California (350 miles).

Richter clearly describes the similar structure of California where the San Andreas Fault is the master fault, corresponding to the Alpine Fault in New Zealand, with geodetically measured drift amounting to 2 inches a year, again in a clockwise sense. In both California and New Zealand the transcurrent movement along these faults is large, and the basin and range structures are the result of smaller vertical components of the faults.

Recent seismic techniques have made possible the determination of the nature of transcurrent faulting which cannot be directly observed and the recent paper by Hugo Benioff, a colleague of Richter's, sums up the available information on a Pacific-wide basis. Around the margin of the structural unit of the Pacific the master faults are transcurrent with clockwise (dextral) movement. Faults which run at right angles to these may be normal (not transcurrent) or counter-clockwise transcurrent and there is a component of over-thrusting as the continental margins tend to be forced against the Pacific unit with the production of mountain-systems and oceanic fore-deeps. Benioff regards the absence of deeps from some portions of the Pacific coast as being part of an historical sequence.

Benioff then points out (p. 406) that, if the measured rate of movement of the San Andreas fault applies to the whole system, the entire Pacific structural unit would complete a revolution in a thousand million years. In the abstract at the head of the paper, however, the time is quoted as three times this. Reference to a globe shows that the first figure is the correct one.

If New Zealand then can be seen in relation to a grandly envisaged world scheme, some details of its home life with earthquakes is given in the admirable book by G. A. Eiby of the Seismological Observatory, Wellington. This splendidly illustrated and clearly written book, designed for the general public, gives details of New Zealand's structure, fault systems and historical earthquakes as part of a general study of what earthquakes are, how we measure them and how we can live with them.

D. W. McKenzie

Pacific Viewpoint

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THE ASIAN AND PACIFIC SCENE

GEOGRAPHICAL REVIEWS

Some Pacific Island Problems

H. BELSHAW

THIS paper examines the requirements for and obstacles to economic development in the Pacific Islands, with some very partial assessment of social consequences.

The area considered is that covered by the South Pacific Commission. This extends from Guam and the United States Trust Territories in the North, through New Guinea, the Solomons and the New Hebrides to New Caledonia, and eastward to include Fiji, the Samoas, Tonga, the Cook Islands, Tahiti and French Oceania.

The islands are numerous and differ greatly in size, ethnic composition, social structure, population, resources, economic advancement, and political status. Hence a descriptive account of the separate territories and their problems would be unmanageable, and we must adopt a generalised approach by considering those aspects and problems which are more or less common. This is reasonable because, although the specific problems of application differ from territory to territory, so that there would have to be separate development programmes differing in detail, we can establish a frame of reference within which such specific problems may be considered.

Meaning of Economic Development

I shall regard economic development as a social process resulting in a cumulative increase in output per head and in levels of consumption, and requiring, and resulting in, changes in production functions and in economic and social organisation and relationships. This requires elaboration.

By changes in production functions we mean simply changes in the ratio of input of labour, resources and capital on the one hand, to output on the other. These must follow because economic development requires improved techniques which imply a different proportion of the factors—for example, more and better kinds of capital—and because changes in both output and consumption patterns imply a change in the kinds or at least proportions of the goods produced. I do not wish to enlarge on this, except to note that it implies changes in the proportions of the total going to the owners of different resources, and therefore in economic status and power.

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Economic processes are, of course, social because economic activities are undertaken in common, and their consequences spread through a society; but by describing economic development as a social process, we mean something more than this. It requires and results in changes in attitudes, incentives, institutions, social forms and social relations ramifying through every aspect of life, and changes in the location and role of leadership. In "less developed" societies, we are told that activities and ends are substantially undifferentiated, in the sense, for example, that there is no clear distinction between religion and economics. A concomitant of economic development is the sharper differentiation of activities and ends, and an increasing division of labour and specialisation of economic and other functions.

These changes emerge because a cumulative process providing more and new classes of goods and services not only affects the pattern of consumption, implying different incentives, but also requires the growth of trade and a money economy, greater relative importance of cash crops, a smaller reliance on subsistence production, and a widening of the market and therefore a widening of culture contacts. It implies the growth of institutions to provide the money, the use of money as a means of accumulating wealth, borrowing and lending, and a class of intermediaries engaged in borrowing and lending, transport and trade. Levels of consumption include publicly provided services such as transport, power, education, and health services. Taxation and expenditure are needed to provide such services, and new forms of local and territorial governments, with corresponding civil services, are also needed.

Our definition requires an increase in output per head. Hence, in our terms, an increase in *total* output is not economic development unless it exceeds the growth in population. This interpretation is warranted because people want economic development to improve levels of consumption. On the other hand, an improvement in levels of consumption provided and financed by metropolitan government is not economic development either, since it does not result from an increase in output per head.

Under-developed Areas and Under-developed Societies

In current discussions on economic development the term "economically under-developed areas" is commonly used, and as a convention, those are regarded as under-developed in which the inhabitants have a low income—below a certain figure. In United Nations discussions two-thirds of the world's population are regarded as living in under-developed areas. This approach has its uses but it is ambiguous and does not bring out the main essentials. To have meaning it would have to do with a relationship between existing and potential use of resources, and the reasonable prospect of their fuller use. In this sense the only areas

approaching full development are probably coral atolls in which there is virtually no scope for fuller utilisation. Even wealthy countries such as the United States and New Zealand are under-developed. Moreover, there is no necessary or close correlation between relative incomes and relative under-development.

We prefer to pose the problem in terms of under-developed societies. These are societies which do not have the capacity to set in motion a cumulative increase in output per head. The causes for this will be complex—for example, the paucity of resources or remoteness from market may be factors; but the conception serves to bring into relief the basic importance of the characteristics of the society itself. A consequence of these characteristics which is of major importance is that the propensity to innovate is not sufficiently strong to satisfy the requirements for increased production.

Leibenstein[1] describes such societies as in quasi-equilibrium, which means that if for any reason total output grows, there is an innate tendency for the increase to be mopped up by population growth.

The general thesis of this paper is that Pacific Island societies are economically under-developed, approximating to a position of quasi-equilibrium. We should be rash to assert that there have been no improvements in levels of consumption or even in output per head over recent years. But as an approximation the generalisation is valid because:

(a) Much of the increase in levels of consumption has been in the form of services provided from outside by metropolitan governments.

(b) Such improvements as have occurred are extremely precarious because of population growth.

(c) There are very serious impediments to sustaining existing levels of output per head, if population continues to increase, still more to inducing a cumulative increase in the future.

Determinants of Economic Development

We conclude this introduction by a summary statement of the determinants of economic development.

Quantitatively these include: (1) an increase in the labour force; (2) an increase in wealth, which covers both natural resources utilisable, and capital; (3) an extension of markets.

Qualitatively they include (4) improvements in the efficiency of labour and capital by better training and incentives, better technology, improved organisation and the like.

It is convenient to cover qualitative factors by the omnibus term *innovations*.

[1] Leibenstein (1957): 15 et seq.

POPULATION GROWTH

Ward and Moran[2] provide a useful digest and analysis of population statistics for most of the area. These are given in the following table:

Population of Major Territories

TERRITORY	POPULATION AT VARIOUS DATES	POPULATION 1956	AVERAGE ANNUAL RATE OF INCREASE (PER CENT)	DENSITY PER SQUARE MILE
Netherlands New Guinea	—	730,421	—	4.8
Australian New Guinea	—	1,287,292	—	13.8
Papua	—	452,159	—	5.0
Total New Guinea	2,293,300(1946)	2,469,872	0.7	5.9
Solomon Islands	94,105(1931)*	104,350	0.4	8.7
New Hebrides	48,914(1946)	50,336	0.3	8.8
New Caledonia	62,700(1946)*	69,830*	1.0	6.9
Gilbert and Ellice Islands	36,000(1947)*	39,102	0.9	98.5
Fiji	259,638(1946)*	345,737*	2.9	49.0
Western Samoa	68,197(1945)*	97,327*	3.3	85.5
American Samoa	18,937(1950)*	20,154*	1.0	276.0
Tonga	32,862(1939)*	56,838*	3.3	211.3
Cook Islands	14,088(1945)*	16,680*	1.5	168.5
French Polynesia	59,399(1946)	73,201*	2.2	48.8

* Census Figure. All other population figures are from official estimates.

In 1956 the total poulation of the area was probably approaching three and a half million, of which two and a half million were in New Guinea. Population figures for New Guinea must have a very wide margin of error. The estimates for American Samoa and the Cook Islands are misleading since there has been *relatively* substantial migration to Hawaii and New Zealand respectively. Accordingly, rates of natural increase are very much higher than those given in the table.

In many Pacific Islands the annual rate of increase exceeds the world average of about 1.6 per cent, and in some such as Tonga and Western Samoa it is among the highest in the world. The following table shows the increase in population for certain territories over a longer period than in the figures just quoted:

POPULATION OF SELECTED ISLAND GROUPS
(IN THOUSANDS)

	1926	1936	1956
Fiji		198.4	345.7
Cook Islands		10.1	16.7
French Polynesia	35.8		73.2
Western Samoa	40.2		97.7

[2] Ward and Moran (1959).

Over the past twenty years the population of Fiji has increased by over seventy per cent and that of the Cook Islands by about sixty-six per cent. Over the past thirty years the population of French Polynesia has increased by about 100 per cent and that of Western Samoa by over 140 per cent. Accelerated rates of growth are due not so much to increases in birth rates as to reductions in mortality. Ceylon may be cited as an example of dramatic possibilities of such reductions. Over the period 1947 to 1951 the rate of increase rose from 1.5 per cent per year to three per cent as a result of anti-malaria campaigns with D.D.T. costing fifteen cents per head.[3]

In some areas in the Pacific, notably New Guinea, there is a strong prospect of a substantial acceleration of the rate of population growth as health measures are extended.

Ward and Moran conclude that twenty years from now several of the territories of Polynesia will have doubled their present populations, while rates of growth in Melanesia are likely to be comparable with present rates in Polynesia. Unless family limitation is accepted and in general use, we should be prepared for the possibility of a population of six or seven million in the Pacific Islands in thirty years. There is, of course, the possibility of a check through a shortage of the necessaries of life, but a Malthusian ceiling is hardly a satisfactory solution.

But there will be difficulties before populations have doubled in twenty to thirty years time. A writer on New Guinea in a recent *Round Table*[4] puts the problem in a nutshell. "As the mortality rate is now declining with better medical services, an explosive increase in the size of the indigenous population can be expected within the next decade, so that the supply of foodstuffs must be augmented." He draws attention to the difficulty in increasing food supplies.

Apart from innovations, it is a reasonable approximation that wealth would have to increase at the same rate as population to maintain output per head. If the natural resources component of wealth cannot be increased as fast as population (as seems likely in many territories) the capital component must increase faster to compensate. Moreover, if as again seems likely in many territories diminishing returns to land occur with more intensive use or the extension to poorer land, there must be a further increase in capital to compensate. This may be offset if there are economies in production—for example in transport—because of a larger population. This does not exhaust the issues. Improved health measures have their biggest effect among the very young and their mortality rates decline most. This changes the age composition of the population and increases the proportion of dependents. As a corollary it reduces the proportion in the labour force, which grows more

[3] See Belshaw, H. (1956): 23, and references.
[4] *The Round Table* (1959):247.

slowly than population. Hence to maintain output per head of *population* there must be an increase in output per head of labour, which requires that wealth increases faster than the labour force. For such reasons the assumption that *apart from qualitative improvements* wealth must grow as fast as population to maintain output per head is, if anything, conservative.

The increased capital component is required for governmental services—roads, power, education, health, and other amenities—as well as for agriculture, fishing, industries, and trade. Moreover, the provision of the services themselves and the maintenance of the capital must show a comparable growth. If these are not financed out of territorial income growing faster than population, they will remain a responsibility of metropolitan government.

It follows, of course, that if wealth has to grow *pari passu* with population to maintain output per head and levels of consumption, it must grow faster than population to increase these.

The above observations are not designed to provide a precise measure of the resources and capital required but to indicate the order of size of the problem. Taken with what follows they warrant a number of conclusions:

(a) The growth in Pacific populations creates a problem of overriding importance in maintaining their economic well-being.

(b) To do this there must be a considerable increase in capital, and most probably in financial assistance from metropolitan governments for services.

(c) The difficulty in increasing natural resources in use, and capital, greatly increases the importance of promoting those qualitative changes which we have called innovations as a means of making resources and capital go further.

Migration and Urbanisation

To some extent pressures may be eased or equalised by migration. The movement of population may be within territorial areas and between them; or to metropolitan countries. Urbanisation is a special case of internal migration.

The movements of Cook Islanders from the Northern Islands to Rarotonga and of Tokelau Islanders to Western Samoa are examples of the former type. They reduce the pressure on the scant resources of atolls, but increase it in the centres to which they go. Internal or inter-territorial migration offers no solution to population pressures, but merely partially ameliorates them in poorer localities. In the main, towns have grown as centres of administration and trade, and to a lesser degree of industry. They are natural concomitants of such economic growth and political development as have occurred, and tend to increase economic sophistication, and encourage individualism and receptivity

to economic change, and so to encourage further growth; but there is a price to be paid, especially if urbanisation is at all rapid, in the weakening of tribal ties in social maladjustment, and in problems of housing, and discontinuity of income and employment.[5]

For the region as a whole, emigration to metropolitan countries does not appear to be significant but it is important from some, particularly Western and American Samoa, the Cook Islands and Niue. The estimated number of Samoans, Cook Islanders and Niueans in New Zealand in 1957 is compared with the island population as follows:

	HOME POPULATION	ESTIMATED NUMBER IN NEW ZEALAND IN 1957
Western Samoa	102,860(1958)	3,000
Cook Islands	16,925(1958)	2,500
Niue	4,735(1957)	900

In 1957 there were 450 immigrants from Samoa, 355 from the Cook Islands and 193 from Niue. The rate of flow has increased over the years. Between 1952 and 1956, 1,400 people emigrated from American Samoa, mainly to Hawaii and the United States mainland.[6] While the totals of emigration are small, they are very large relative to the island populations. Nevertheless they are smaller than the natural increase.

The age composition of migrants tends to differ from that of the home population, comprising a larger proportion of active working age, a large proportion of males, and a smaller proportion of the dependent young and old. Migration therefore tends to reduce the ratio of labour force to population among those who remain. This weakens the effect of migration in reducing population pressures, but may tend to reduce future birth rates. Some advantage is likely to follow from remittances by migrants to their kinsfolk. In addition to the social and economic costs of movement, immigration policies present a barrier, so that, except for the territories referred to, there seems little prospect that emigration to metropolitan countries will prove any more important in the future than it has in the past. New Zealand, for example, is not likely to accept immigration of any size, except from territories with which there are constitutional ties.

Racial Composition

Except in New Caledonia, Fiji and French Polynesia, the estimated non-indigenous population is less than ten per cent of the total. In nearly all the remainder, the estimated non-indigenous population is less than two per cent. Chinese are located in Australian New Guinea, Nauru,

[5] For a fuller dicussion of internal population movements see Ward and Moran (1959).
For a study of effects of urbanisation see Belshaw, C. S. (1957).

[6] Ward and Moran (1959).

Fiji and French Polynesia; Indians in Fiji; Indonesians in Netherlands New Guinea, New Caledonia and New Hebrides; Vietnamese in New Caledonia and New Hebrides. In these islands Asians have provided an important labour force and trading class. Europeans have been religious leaders, administrators, traders, professional men and technicians and have been the main non-governmental source of finance. Perhaps the majority of Europeans, however, are not permanent residents but return to their home countries after tours of duty.

Non-indigenous residents have played a part in economic, social and political change out of all proportion to their numbers and will continue to do so. As territories move towards greater independence, or self-government, there is, however, a strong and natural tendency to increase the role of indigenous people in government, administration and technical services. This raises quite difficult problems of training, and even more of orientation, in the sense of acceptance of an impartial civil service tradition. We are asking the people to accept new types of leaders, with functions substantially different from those which are traditional.

Where the non-indigenous populations are large, as in Fiji, and growing rapidly, there are grave problems. The Indians are economically and politically more sophisticated than the Fijians, so that complete and untrammelled self-government might well endanger the position of the Fijians, who are now in a minority.[7] On the other hand protection of the Fijians by legislation against alienation of land is for the time being likely to hamper economic development because, in general, Indians would at present use the land more effectively.

RESOURCES

Certain countries, such as Switzerland, have developed highly advanced economies even though they are not rich in resources. They import raw materials and export services either directly or in the form of finished goods. While some development of services, for example through tourism, is possible, and small local export industries using imported materials—for example in Rarotonga—may develop, such can only be a minor contribution to a cumulative process of growth in the Pacific Islands.

The question then arises of the adequacy of existing resources to "support" growing populations. In our context "support" means, not simply to provide bare subsistence, or even maintain existing levels where they are above subsistence, but to provide a basis for a cumulative increase in output per head: but we are concerned, of course, with more than food—with maintaining and improving economic and social well-being. This covers other consumer goods, housing, recreation, trans-

[7] In 1957 there were 153,000 Fijians, 177,000 Indians, and 30,000 "others".

port, health, education and other public services. But the basic requirement will be more food.

The latest report of the New Zealand Department of Island Territories referring to the Cook Islands uses the phrase "limited economic potential". This is a phrase which could be applied very generally. Except on atolls there are few islands in which all the land is cultivated, and a superficial glance at New Caledonia, Fiji, Samoa and the Cook Islands, for example, would reveal a relatively large area of unfarmed land which might suggest substantial scope for development. But most of this land is infertile or too steep and broken, and offers little scope except possibly for afforestation, which would not support large numbers of people. Moreover, the popular picture of lush, tropical paradises is fanciful even in respect of cultivated land. In wet, tropical areas, plant nutrients are rapidly leached away, especially when forest-cover is removed.

On New Guinea where probably live five out of every seven Pacific Islanders, the writer previously quoted[8] states:

"The greater part of the island is clad in dense forests, and the coasts are frequently bordered by wide swamps or else they rise almost directly to precipitous mountains . . . The island receives a heavy rainfall which has an adverse effect upon the fertility of the soil . . . In most places the potentially fertile volcanic deposits either are inaccessible or have been leached of the plant nutrients necessary for successful crop cultivation. The alluvial soils are extensive but they have not been properly studied and their use for large scale agriculture presents many problems. Extensive investigations are now proceeding, but it would appear that successful utilisation will depend upon the use of advanced technology. The available arable land may not exceed ten per cent of the total; and this small agricultural potential compares with that of Borneo where wide areas are neutralised for climatic or other reasons."

Spate[9] states that only about 8.4 per cent of the total area of Fiji is cultivated, but adds that "possibilities of spatial expansion of agriculture with currently available techniques are more limited than is often supposed". He quotes a projection of population to 584,000 by 1971, from the 1956 total of 346,000 with the comment: "The increase over 1956 of nearly a quarter of a million souls must be seen against a background of very serious erosion and soil exhaustion, particularly in the more populous western plains of Viti Levu."

The traditional reply to the problems of soil depletion is shifting cultivation. An area is cleared, planted for a year or two and then left for the forest to recapture and rejuvenate, for cultivation again in say

[8] *The Round Table* (1959): 240. A footnote to the article states that there were differences of opinion among members of the two Australian *Round Table* groups on facts and opinions in the article, but there is no indication whether these differences apply to the passages quoted in this paper.

[9] Spate (1959):1-2.

ten to twelve years. As population grows the cycle is shortened, there is less time for natural recovery, and soil exhaustion and soil erosion occur. This is already happening, for example in Western Samoa, and as population becomes more dense the problem is likely to become more general and serious.[10] Moreover, poorer lands must be brought into cultivation.

To feed any considerable increase in numbers would require settled cultivation, composting, the use of fertilisers, improvements in the control of pests and diseases and, indeed, a revolution in agricultural techniques.

Surprisingly enough, in some islands water is also a limiting factor. Copious rainfall sinks into the coral or volcanic rocks. To get more water, money and labour must be used on reservoirs, rain collecting systems, pipes and so on.

In many tropical islands the picture of reefs teeming with fish is another illusion. Reefs have been over-fished, sometimes with the use of dynamite, which destroys fish food as well as fish. To augment the supply it would be necessary to restock and control reef fishing and fishing in estuaries, establish fresh water fisheries, and, above all, develop deep sea fishing. As is shown by the cannery at Pago Pago, there are possibilities of developing an export trade in fish products. Indeed, the resources of the sea might provide a significant supplement to land resources. But again, a revolution in techniques would be needed, and capital for boats, gear and preservation plant.

The moral of all this is that, apart from substantial improvements in technology, and heavy capital expenditure in relation to territoral "national" income, natural resources impose a limit on food supply. In many islands, perhaps the majority, it would be most difficult if not impossible to provide adequate food for double the present populations.

MINING AND MANUFACTURE

In New Caledonia and Nauru, mining is a major source of income and it provides a useful addition in others, particularly New Guinea, French Polynesia and Fiji, but except possibly in New Caledonia there seems little prospect of its becoming a foundation for cumulative growth over a long period. In any case minerals are an exhaustible resource. In most Pacific Islands there are no mineral resources to speak of. Even in New Guinea, despite a common belief that there are rich, untapped resources in minerals and oil, it is stated:

"No major deposits have yet been located of the more important minerals. The coal deposits are poor in quality and meagre in size, though this deficiency may

[10] For a comprehensive survey of shifting cultivation and its problems see Watters (1960).

be offset by the development of hydro-electric power . . . A prolonged and expensive search for oil has had two minor successes."[11]

Manufacturing industries are of four main types.[12]

(a) *Industries processing local raw materials for export*: The major examples are nickel refining in New Caledonia, sugar milling in Fiji, fish canning in American Samoa, and coconut oil extraction and plywood manufacture in New Guinea. There are also a number of minor industries such as button making, cocoa and coffee processing and mat making.

(b) *Industries processing imported raw materials for local consumption*: Illustrations are soft drink manufacture, brewing, soap manufacture, boot and shoe manufacture and biscuits.

(c) *Industries processing local raw materials for local consumption*: Soap making, button manufacture, meat and fish canning, saw milling, boat building, and furniture making are among the examples.

(d) *Industries manufacturing products for export from imported raw materials*: These are few in number and include biscuits and clothing from Fiji to other Pacific Islands and clothing from Rarotonga to New Zealand.

The main scope for industrialisation is probably in the processing of local raw materials for local consumption, though the possibilities have not yet been exhausted of export industries based on local raw materials —for example fish canning and processing of copra if, in the latter case a plant were established supplied with copra from a number of territories.

As the volume of consumption rises manufacture for local needs will expand, and so make its contribution to development and the conservation of exchange. But the only advantage the Islands possess in processing imported materials for export is in low wage costs in those types of production where low wages imply low labour cost. In terms of types of enterprise, this is not a widespread advantage, and against it there are formidable disadvantages: shortage of technical and managerial skills, the delayed start, which implies effective competition from established industries elsewhere, difficulties in growing large enough for economies of scale, and—as in the case of Rarotongan clothing—opposition from labour to the importation of goods produced by low-wage workers.

By and large, to suppose that industrialisation will provide a way out, following the pattern of developed economies, is a pipe dream.

MARKETS

Economic development would require the expansion of markets

[11] *The Round Table* (1959): 240. The gold deposits, which have long furnished an important export item, are now practically exhausted.

[12] *South Pacific Commission* (1958).

beyond those of the small, individual territories. Great distances, coupled with the small volume of produce in individual islands, the maintenance of quality, shortages and costs of transport, problems of coincidence of shipping with the ripening of perishable crops, or costs of storage and conservation, create difficulties which are very general. While markets in metropolitan countries should grow with the expansion of their own populations, they are at present limited at least for perishable crops, and there is a tendency to restrict imports to islands for which there is a special responsibility. Restrictions on Fijian bananas into New Zealand are a case in point.

Given the growth of island populations and the problems of maintaining food supplies, there is a further limitation which may prove to be of major importance. If land has to be increasingly used to feed local populations this may greatly restrict the capacity to export the products of the land to provide foreign exchange for imported capital and consumer goods.

CAPITAL

Sufficient has been said to indicate the importance of more capital, but space precludes an adequate discussion of capital needs and of what is required to make it available. Only a bare summary is attempted.[13]

The main approaches would include:

(a) The encouragement of voluntary savings.
(b) Compulsory savings through taxation, market levies and the like.
(c) Encouraging the direct application of labour to capital formation.
(d) Private investment from outside, and government grants and loans.
(e) Provision of suitable arrangements to promote these ends and to provide credit for production and trade.

Voluntary savings depend on the ability to save and the willingness to save. The former requires the general extension of the money economy and adequate income in excess of conventional needs. The latter requires a growing recognition of the value of capital accumulation for production, and the conception of money as a "store of wealth" and of money savings as a source of income. In most island societies social rights and obligations are a deterrent, since an accumulation of purchasing power is a standing temptation to friends and relations to demand a share. Equally, the "demonstration effect" of Western levels of consumption, referred to again below, provides a strong temptation to spend income as it is received, and incur capital expenditure unsuited

[13] For an excellent account of problems in promoting more capital formation in 1954 see Stace (1954).
As a case study of one territory see Belshaw, H. and Stace (1955).

to the productive system, or which is inexpertly used and maintained —for example expensive farm machinery for small holdings as among the Indian peasants in Fiji.

The growth of the habit of saving requires patient education and propaganda as well as suitable facilities. While voluntary savings are not likely to be sufficient to meet the needs of the private sector there are encouraging signs in some places of the growth of the saving habit. For example, as of 31st March 1958 there were 7,949 depositors in the Post Office Savings Bank in the Cook Islands (7,421 in 1956 out of a population of 16,680) with deposits totalling £197,729. On 31st December 1958 deposits in the Post Office and Bank of New Zealand in Western Samoa totalled £705,000. There is no information available to the writer on how much of these amounts is held by traders or European officials. The Bank of American Samoa has promoted savings by encouraging privacy and by linking deposits with credit so that relations do not know whether a person has made a conspicuous purchase out of deposits or loans. Credit Unions in Fiji and various other types of co-operative societies in New Guinea, Fiji, the Cook Islands and elsewhere provide a valuable means of encouraging the saving habit.[14]

Taxation as a means of financing capital expenditure also has its limitations. With small individual incomes in an only partially monetised economy, the complete lack of accounting, or indeed ability to keep accounts among the great mass of the people, the high cost and administrative difficulty in collecting small sums from individuals, the disincentive effects of direct tax impositions, and inadequate fiscal administrations, all impose obstacles to the use of income taxes and other direct taxes. Few territories impose income tax and among those which do it provides a small proportion of tax revenue. Hence income tax is virtually confined to business men, and those in the professions and administrative services. Taxes tend to be levied on things which can be seen and counted, like heads, or transactions which can be intercepted. Hence reliance on import and export duties, sales tax and turnover tax.[15]

To encourage the indigenous people to accept more taxation for development and services, there is a lot to be said for making the relationship between taxation and expenditure clear and close; for example for as much reliance as possible on local government taxation, and by

[14] Recent information is not available to the writer, but in the Cook Islands in December 1957, only two years after the appointment of a cooperative officer, there were 29 societies with 2,604 members, savings totalling £7,243 and assets valued at £9,967.

[15] For example in Western Samoa in 1958, out of a total territorial revenue of £1,244,000, £879,000 was provided from taxation, income tax provided only £94,000, while export duties provided £217,000 and import duties £517,000.

making grants-in-aid to local government authorities out of territorial revenues as a means of stimulating local effort.[16]

Marketing levies can go even further in this direction by crediting the levies on crops marketed to the development of specific industries, or even to individuals for specific development expenditure. The Fiji Development Fund, created by a levy on copra, applies the latter principle, and the possibility of similar approaches in other territories is worth studying.

Encouraging the direct application of labour for local development works and amenities is an important ingredient in so-called community development programmes or aided self help schemes. These require a combination of education and technical advice and help, the promotion of suitable local organisations, and grants-in-aid. They imply a re-orientation of government services toward helping people help themselves rather than doing things for them. This process of re-orientation is going on, but it needs to go further.[17]

The progressive increase in the responsibility of territorial legislatures for raising and expanding territorial revenues, and of the indigenous people in the legislatures is an important means of promoting self help.

There has been a very considerable volume of private investment for the Pacific Area as a whole, but this writer cannot even guess at the amount. Naturally enough, however, business concerns and "expatriates" tend to invest profits and savings elsewhere. Currently there may well be a net drain in some territories, which warrants the exploration of methods to encourage investment of current savings of Europeans in the territories.

Relatively heavy grants from metropolitan governments for services and capital are inevitable. For example, in the Cook Islands in 1957-8, expenditure totalled £788,000, territorial revenue was £444,000, and subsidies and grants from the New Zealand Government £391,000. Currently, New Zealand is contributing about £22 per head of the Cook Island population. Without a very careful breakdown it is not possible to estimate the total going to capital development. If, as we should expect, metropolitan governments continue to accept responsibility for the welfare of island peoples, then we must also expect substantial increases in the cost to metropolitan taxpayers in the future.

Consideration of institutional arrangements would require a treatise.[18]

[16] For an elaboration in the Cook Islands see Belshaw, H. and Stace (1955).

[17] The whole orientation of the Belshaw-Stace report on the Cook Islands was in the above directions. For a fuller exposition see Belshaw, H. (1955).

[18] Currently the South Pacific Commission is undertaking a study of capital formation in the islands which will deal with the matters raised in this section, including institutional aspects. Some of these matters are dealt with in Belshaw, H. (1959); this study is concerned with peasant societies and some modifications in application would be needed for tribal societies.

In addition to economic backwardness, small size precludes anything approximating to a money market in Pacific territories. Where trading banks exist they tend to follow the traditions and practices of commercial banks of metropolitan countries, with emphasis on short term credit and on credit worthiness in the sense of requiring adequate cover in the form of tangible assets. They provide valuable services to the business community, but are not suited to the needs of the majority of the indigenous people, who would be intimidated by the requirements and atmosphere of a trading bank, being unable to present a case, or provide suitable security.

The lines of approach include, *inter alia*:

(a) Where a territory is large enough, the establishment of banks combining trading and development credit, and short term and long term or medium credit.

The Bank of American Samoa suggests a line of approach:

(b) Establishment of separate development funds as in Fiji.

(c) Attention to the special problems of security occasioned by the characeristics of communal societies, the lack of clear individual titles to land, and the lack of economic sophistication. These suggest consideration of the substitution of repayment capacity instead of credit worthiness as a basis, by using crops as security and linking credit with marketing, close association of agricultural and other advisory services and of technical help with credit, the use of co-operative societies as a means of providing collective security, and possibly the trial adoption of supervised credit in some areas along the lines of programmes in Latin America.[19]

(d) Increased attention to the encouragement of small savings among indigenous people.

SOCIAL CONDITIONS

The transition from economically under-developed to developing societies implies a transition also towards western type capitalist democracies, or totalitarian regimes. The latter is ruled out if only by the political traditions in the responsible metropolitan countries. The obstacles are formidable and include the whole system of mutual rights and obligations in "communal societies", the incomplete growth of a money sense, the absence of individual titles to land and the intrenched power of traditional leaders. These present obstacles even to the successful functioning of co-operative societies, despite the capacity to work

[19] See Belshaw, H. (1959): Chapter 9; Burns, Watson and Peacock (1960): Chapter 6.

together for common ends, for co-operatives are a Western innovation, and a form of doing business so that members of a society must conform to unfamiliar *business* principles and practices.[20].

Western observers commonly stress the necessity for a transition towards individualism to strengthen incentives to effort, encourage capital accumulation and engender a greater willingness to accept new techniques. Generally this implies a transition from tribal to peasant societies.

On the other hand, a successful community development approach, touched on earlier in relation to capital formation, appears to the present writer to be a *sine qua non* of economic development in Pacific Territories. But this implies collective as well as individual effort, and in the early stages the former may well necessitate reliance on traditional leaders. There is then a problem of using existing leaders in such a way as not to entrench them indefinitely, provide scope for the emergence of new types of leadership, and not impede the process of individualism. In enlarging on the weaknesses of existing social arrangements and stressing the need for a closer relationship between individual effort and individual reward, there is a tendency to oversimplify and go too far. There is equally the need for new forms of organisation and association for action in common, both for Western types, such as partnerships, co-operatives, and local government authorities and for indigenous types which emerge "naturally" out of the existing social situations.

The new forces let loose by economic development—or even by the impact of other cultures when they do not lead to economic development—undermine existing value systems, weaken existing sanctions and centres of authority, disrupt communities and create conflicts. They may well be associated therefore with political and social unrest. The "demonstration effect" of Western levels of consumption, which is all the stronger when relatives who migrate report on the wonders of Metropolitania, awaken aspirations for betterment which add to dissatisfaction and unrest if, as seems possible, these aspirations exceed the capacity to satisfy them. Such aspirations are necessary as a stimulus to effort, but some items on the new scale of preferences may do harm rather than good—for example to health through the substitution of canned foods for local products—and discourage accumulation.

Nevertheless, economic development requires change, and a greater capacity to innovate and accept innovations. While improved technologies will be embodied in new capital, an indigenous process of promoting and adopting innovations is not likely to occur in the absence of substantial technical assistance from outside. This increases the re-

[20] See for example various Annual Reports of the Registrar of Co-operatives, Fiji, Suva (e.g. 1949 and1951) and *South Pacific*, Vol. I, No. 1, Sydney, 1946. See also Spate (1959): *passim*.

sponsibility of metropolitan governments to improve the capacity of island populations to help themselves, not only through education, training and improved health, but also by advisory services, providing appropriate financial and marketing institutions and arrangements and assistance in developing more suitable forms of organisation.

Such help is, of course, being given, and there is a welcome change by way of greater emphasis on aided self-help rather than doing things for the people though this is necessary too. But there is great difficulty in establishing a corps of people who make island service a career and who, in addition to technical and administrative competence have the personality and experience necessary for a sufficient perception of the differences between their own and island societies. A corollary of the transition is a progressively increasing participation of island people in government administration, technical and professional services, and business. However, this is likely to be a slow process among people but recently, or still, in the stone age.

Finally, we note the difficulties in administration as well as in economic expansion resulting from the small size of many territories, ethnic and language differences, and difficulties in communication brought about by the great distances or topography. These are intensified by the fact that many territories over which some measure of economic integration might be possible are under different administrations.

THE FUTURE

We do not pretend to have done more than sketch in a rough picture of the major conditions and problems. Much more thorough investigation is needed, territory by territory and for the region as a whole. In this, if given more support, the South Pacific Commission[21] and the Universities could play an important part. Neverthless, we believe that the broad picture is true enough, though it would have to be qualified in various particulars for individual territories. The approximation we have attempted gives no grounds for optimism: for on the overshadowing importance of prospective population growth in relation to far from rich resources there can be no doubt. If this growth occurs there can be no cumulative improvement in output per head over any long period, or in levels of consumption apart from growing subventions from metropolitan countries. This points to family limitation as an essential ingredient.[22] Among the people as a whole there is as yet no perception of this need, but it is beginning to be recognised by some leaders. At the

[21] The Commission's Annual Budget of about £220,000 hardly seems adequate for its task.

[22] The Burns Report has recently recommended that the Fijian Government should provide additional family planning clinics and that free contraceptives should be made available to married persons who wish to use them (Para. 34).

last South Pacific Conference held in Rabaul in May 1959, Mr Semesa Sikivou, a Fijian delegate, stated that the acceleration of health measures could result in over-population in some Pacific Territories. The answer, he said, lay, of course, in family planning. Other delegates spoke of the effects of improved social services in reducing mortality and increasing population pressures. But it is a long step from awareness of the problem among a few leaders to the practice of family limitation by the people as a whole.

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The Village and the Bush

The Evolution of the Village Community, Wellington Province, New Zealand

S. H. FRANKLIN

> "This making over of the accessible parts of the North Island inland forest was the outstanding achievement of our people . . . The achievements of all these ordinary struggling people makes the really significant history of the North Island."
>
> George Jobberns

A SIGNIFICANT "COLONIAL" FORM OF SETTLEMENT

ONE of the first impressions of her new life that remained with Carol Kennicot as she travelled with her husband to Gopher Prairie was the sight of Schoonstrom. Schoonstrom was not unlike the village of Riversdale in which that invention of John A. Lee, Albany Porcello, spent part of his adolescence. Somewhere in Southland, New Zealand, "Riversdale was and still is, a one street village, with shops on one side of the street and the railway station on the other . . . Riversdale had two pubs and one butcher's shop, a grocer's shop and bakery . . . There were also two of those old-fashioned forges, now mostly replaced by motor mechanics' workshops, and an emporium or two of catch penny consequence . . . a Presbyterian kirk, a Church of England, a Catholic Church . . ." In Schoonstrom, "The business centre took up one side of one block facing the railroad. It was a row of one-storey shops covered with galvanized iron, or with clapboards painted red and bilious yellow . . ."[1]

The appearances of the two villages as they are described by the novelists have a strong resemblance. Much that one reads about the North American village, whether it is a geographer or rural sociologist that writes, confirms one in the belief that here are two strikingly similar forms of settlement. And it would not be too presumptuous to predict that ultimately, when as much is known about the New Zealand and Australian village as is known about the Canadian and the American village, the Australasian and the North American village will be recognised as belonging to a common type. This is understandable for the New Zealand and the American village are in many ways products of

[1] Sinclair Lewis, *Main Street,* Penguin Books, 1950, p. 30; John A. Lee, *Children of the Poor,* T. Werner Laurie, London, 1934.

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the nineteenth century; and their evolution has been markedly influenced by the technological, social and economic changes engendered by the industrial revolution during its latter phase. Their common cultural origins and historical experience help to explain the considerable range of similarities displayed, despite the entirely different environments in which each form has been established. A study of the New Zealand village is therefore of more than local interest because there is little doubt that it is an example of a more general type of rural settlement, a type profoundly different to the European village whose origins date back to the pre-industrial era. The present intention is not to pursue an analysis of these similarities, which is not possible in the circumstances. But it seems worth while to draw attention to these affinities and to the fruitful field of research which they suggest. North American and Australasian geographers, while they tend to derive their ideas from Europe, are nevertheless both dealing with societies which have much in common, and from which many of the factors fundamental to European society are absent. The influence exerted by the conditions of the pre-industrial period are negligible in New Zealand. As a consequence the human geography of New Zealand is by inference placed in a frame of reference significantly different to that necessary for an understanding of European geography. An analysis of the evolution of the New Zealand village is of some value in establishing this framework.

While emphasising the similarities of the North American and New Zealand village, one must at the same time refer to the variations in the usage of the term "village" which are likely to lead to misunderstanding. In New Zealand it has been suggested that the term should be restricted to nucleated settlements with populations of less than 1,000 which are without any form of locally elected government.[2] Such a condition would be inappropriate in many parts of the United States, where, furthermore, the upper population limit for a village is set customarily at 2,500. It has been argued that for New Zealand the distinction between village and hamlet would be pedantic and therefore should not be made. "Hamlet" is used in the United States, and sometimes refers to what would be called a village in New Zealand.[3] Some New Zealanders object to the use of both hamlet and village because of the close association these words have with English rural landscapes and settlements, of which there are few reminders in the Dominion; but alternatives such as "township" are not current, and carry a different meaning in the United States; while the term "trading centre" is no more precise, and certainly more cumbersome. However, these terminological difficulties are not prohibitive; what is of greater importance in creating misunderstanding is the fact

[2] Anderson and Franklin (1955).
[3] Trewartha (1943).

that "village", in America, is used to refer to a number of historically different settlement forms, some of which have no counterpart in New Zealand.[4] Dwight Sanderson makes this distinction, "Many villages in the older parts of the country are strung out along the main highways; in the newer sections they are more often checkerboard type with stores radiating from the four corners but mostly on Main Street."[5] It is with the villages of the newer sections that the comparison is made, for the history of European settlement in New Zealand, unlike that of the Eastern Seaboard, does not go back beyond the middle of the nineteenth century.

The New Zealand village consists of a number of houses, shops, churches, a hall, perhaps a garage and a road hauler's yard, often a dairy factory, grouped most frequently alongside a railway line. It may be of crossroad or linear form, but usually the ground plan is checkerboard and is often still apparent; occasionally, only a vestige remains so that the form appears to be linear. The frequency with which the checkerboard ground plan appears is related to the frequency with which these villages were founded by the Government on Crown land or by settlement associations which derived from the Crown their title to the land. A large proportion of the sections in the grid pattern have remained vacant, and this gives the settlements an untidy appearance. Because their most marked period of growth occurred during the latter part of the last century the style of architecture is predominantly colonial Victorian and red corrugated roofs and dirty yellow clapboards are most frequent. They are aesthetically displeasing though the pastel colours developed since the war do considerably enliven the architecture. Those few houses which have been added during the post-war period follow the stolid architecture of the New Zealand State House, a comfortable compromise of architectural aspirations and taxation exigencies, and these, together with the ventures into modern architecture made by local builders, do little to create a proportion or unity in the cultural landscape. Main Street is too broad, and the daily activities staged there are in relation to its great width few. Overall an air of deflated nineteenth century optimism and credulity persists.

But despite their exterior drabness the interiors of the houses are comfortably furnished and well provisioned with those necessary luxuries of modern life, electrical refrigerators and washing machines. Social life in the village is full, if not intense. A dozen or so clubs and societies function in most medium sized and large villages; and quite a few possess new and attractive halls, subsidised by the government, in which social activities are held. Some villages have their own small libraries to which the State Country Library Service loans periodically a quota of fiction

[4] Trewartha (1946).
[5] Sanderson (1942): 253.

and non-fiction books, which are both up-to-date and of a good intellectual standard.[6] As a whole the standard of living of the villagers compares favourably with that of the town dwellers. The high per capita productivity of New Zealand farming together with the implementation of the Welfare State go far towards explaining this equivalence of standards.

Population, Economy and Social Life

The village is not usually a place of residence for farmers, only the few that happen to have their holdings on the edge of the village may be called village dwellers. Because of the mechanised nature and capital-intensive structure of New Zealand farming farm labourers form neither a large group in the countryside nor in the village. Most of the village males find their employment in tertiary industry and in secondary industry. Those working for the railways or driving trucks form a large group, as do the shopkeepers and their assistants, and the builders, plumbers and carpenters. Most of those classified as engaged in manufacturing work at the local dairy factory, but there are such miscellaneous industries as the manufacture of cement posts, motor vehicle repair work, even toymaking. Another large group of the male population is composed of retired persons. The proportion of workers who are employed by the state or local bodies is not insignificant; these include railways, public works and county employees, as well as post office officials, schoolmasters, policemen and veterinary surgeons. Many of the retired men draw a pension from the state and every mother draws a child allowance for each dependent child. A notable proportion of the income of the village must be drawn from the state in one way or another. Originally established or promoted by the state to provide a population of small farmers, who would also be available for hiring as farm labourers, these villages persist, in part, because of the state controlled services which they bring to the countryside.

Very few females are employed outside the home, but occasionally

[6] Stranded in Otane (population c. 400) in 1956 a visitor need not have despaired of some intellectual stimulus. While the purchases of the Otane Library Committee rather tended to favour such authors as Sapper, Zane Grey, Leslie Charteris, Francis Parkinson Keyes and Anya Seton, the fiction section supplied by the Country Library Service included some of the works of Jane Austen, Compton-Burnett, Joyce Cary, Albert Camus, Dostoyevsky, A. Gide, Hemingway, S. Kaufman, Thomas Mann, J. P. Marquand, Tolstoy and Evelyn Waugh. Such subjects as Gardening, Food, Pets, Music, Travel and Biography were covered by the non-fiction section. Generally the coverage given to recent political and international affairs was inadequate, though Crossman's *The God that Failed*, Laski's *The Dilemma of Our Times*, Keesing's *South Seas in the Modern World*, and W. O. Douglas' *Beyond the High Himalayas* were available. So, surprisingly enough, was Warner's *The Structure of American Life*. In all the 120 subscribers were quite well served though the range of children's books was poor.

since World War II small branch factories of textile manufacturers have been established in a few villages. The young unmarried females above school age may find employment in the shops of the village, but generally for both sexes and especially for the males, the employment opportunities for the adolescent are very restricted. Consequently most of them migrate, some males to work on farms, most males and females to work in the cities. This absence of youths between the ages of fifteen and twenty-five gives the age structure of the village a characteristic shape, which reveals the three main age groups that constitute village society: the children of school age and below; their parents, who constitute the bulk of the active population; the retired group. Between themselves these three groups create the pattern of social life in the village to which the surrounding farming population which uses the village particularly as a centre for social activities makes an important contribution. The post-war rise in the birth rate is reflected in the increasing school rolls, and the increased expenditure on school bus services and school buildings. The various needs of the children bring the village people together socially, as members of the school committee or of the parent-teacher association, or as spectators at the school picnic or prize-giving ceremonies. The whole community will be caught up in the drive for funds for the school swimming pool, during which many private houses will be opened to the village and the surrounding rural dwellers for money-making social evenings. The younger married members of the community, while they may be preoccupied with raising their families and attending to their business, nevertheless find time to meet and mix with the retired group, as church members, as councillors of the domain board, or as keen supporters of the rifle club. Above all it is the retired group which gives the villages their air of leisureliness.

The principal functions performed by the New Zealand village are suggested by the account of its occupational structure and social groupings. The least important function is to serve as a place of retirement; a function attributable to a village's accessibility to a larger urban centre, or the attraction exerted by the local climate or topographical setting, and by lower living costs. The most enduring function of the village is to act as a centre for social activity, in which both the farming community and the village dwellers participate. However, the absence of a village does not necessarily hinder rural social life. There are a number of settlements which consist of little more than a school and schoolhouse with, perhaps, a church or hall, and they act as the centre for a surprisingly full annual round of social activities. Such occurrences appear to be less closely related to the degree of isolation of the people (as at first one might suppose), and more related to the existence of a developed sense of neighbourhood, and the encouragement and stimulation given to social life by a few energetic local residents.

If the most enduring function of the village is the social function then

the most critical function is the economic one. For the extent to which the economic aspect is developed determines the size of the village, distinguishes the large from the small, and ranks them in order of relative importance. Furthermore it is the economic functions which produce the urban-like character of the village and which tend to create a division, however slight, between the interests of the farming community and those of the village community. The village which consists of a dozen houses, a dairy factory, a post office, school hall and church, is too small either to consider itself, or to be considered by others to be separate from the farming community. But when stores, garages, perhaps a bank or very small factory are added then the village becomes a distinct community and it is recognised as such. Formally at times; for there are still a number of villages which as independent town districts have some control over their affairs; and in the 1920s their number though never large, was greater. More recently, in recognition of the village's own needs, legislation has been passed which permits the village to levy rates specifically for its own purposes, although it is still administered by the rural county council. But the physical, economic and social distinction between the larger village and the farming community has never been of any great consequence. And the urban-like features which the stores, the factories, the transport and builders' yards, together with the ground plan, give to the village, are not incipient urban features capable of growth and elaboration. They are residual urban features left to the village in the twentieth century by the paring back process of technological development, centralisation, urban drift, specialisation and division of labour.

The type of industries which remain located in the village have normally a low co-efficient of localisation. The dairy factory collects a bulky raw material from a number of dispersed producing units. The cement post factory produces a very bulky product to be delivered over a comparatively wide area. The builders, plumbers, butchers and carriers have to be near their market, for they offer what amounts to a personal type of service. The shopkeepers, for their part, are restricted to selling very standard lines of day-to-day goods, food, tobacco, small hardware, working clothes. When fashion, quality, wider range, marked consumer preference, or large credits are involved, the village retailers cannot compete with the city shops. In the sixty villages mapped the one venture in the retailing of furnishings and furniture so far recorded has proved a failure.

Although the village community is the most immediate link between the rural community and the greater urban and national community; although it is functionally a trading centre serving the needs of the surrounding rural community, distributing or collecting some of its goods, processing some of its raw materials, its position in the structure of the total economy is a marginal one. The village still reflects, as it has

always done, the pulsations of economic change and development; but now reflects them weakly and laggardly. The period 1951-58 has been a period of marked economic prosperity in the Dominion, but only in the last few years has the swirl of development reached the village. In 1954 the villages of the Wellington Province had about them an air of stagnation; nothing, it seemed, had happened to them since the nineteen twenties. Since that year very slowly and very selectively signs of advancement have appeared in a few villages: the sidewalks repaved, a renovated store; three new shops in a block, built speculatively for renting; a small textile factory; a bank, new to the village, opening up a branch office. In all, not much. More general however has been the increase in houses and social amenities. The houses are usually local government constructions, or belong to a dairy factory; and represent attempts to attract labour to the countryside during a period of inflation, labour shortage and prosperity. The new school buildings reflect the post-war increase in the birth rate and the dearth of such capital expenditure since the depression era. The school swimming baths, the new social hall reflect the prosperity of the farming community and the financial support of the government. Significantly, the improvements related to social life, rather than economic life, are more widespread and more apparent. This is to be expected, for the very factors which have reduced the economic role of the village are still at work, and in consequence there are few grounds for expecting a reversal of the trend. But the wealth and prosperity of the rural community, its standard of education, and its not inconsiderable time for leisure, all permit a full social life, which, surprisingly, is not satisfied wholly in the adjacent borough or city. The social function appears to be the village's most enduring function which neither the radio can fragment into a host of individual parts nor the car, cinema, dance hall, disperse into a greater anonymous mass.

Regional Varieties

The regional variations displayed by the village must not be forgotten. In contrast to the villages of the Wellington Province there are in North Auckland and on the southern margins of the Waikato a few villages displaying vigorous growth. Pio Pio, located on the border of the agriculturally developing parts of the King Country, displays the effects of economic advancement within the area. In May 1958 it revealed an economic strength not apparent two years previously. Conceivably it could exceed a population of 1,000 within the next decade, i.e. double the census population of 1956. Tirau is conveniently sited at the junction of two important highways of the Central Plateau, highways which with the post-war development of the exotic timber industries, the greater number of private cars, and the extension of farm land in the area, carry an ever-increasing volume of traffic, and the village in consequence

displays an unaccustomed vitality. Again Tirau might qualify for the status of a borough within the next few years, but its future is limited by the proximity of larger and more prosperous rival centres. In North Auckland, where the extension of farm land has stimulated the development of certain regions, and where the broken and attentuated topography favours the multiplication of small service boroughs, a number of villages are displaying a more that usual vigour, apparent from the end of 1953, e.g. Maungaturoto, Wellsford, Ruawai.

Close to the Wellington and Auckland Urban Areas there are examples of villages developing into quite different forms under the influence of urban expansion. As one approaches Waikanae (thirty-six miles north of Wellington) from the south, the old village can be picked out between the railway line and the steeply-rising greywacke hills upon which the burnt bush is already well regenerated. The village retains its checkerboard plan and all the standard features are to be seen: church, hall, mechanic's shop, butcher, store, bank agency (little more than a box), the new and the old school building. But in addition to all this and ultimately overwhelming the old village is a ribbon of settlement stretching westwards to the beach settlement; a cluster of tearoom, fruit and vegetable store, land sales agency, gasoline station, tobacco and magazine store and poultry farm, all beseeching the attention of the motorist. Hard by and to the north of the village recently subdivided sections, laid out geometrically, are filled with brightly coloured week-end houses, the earth broken and raw for kerbstone and asphalt. The city thus successfully engulfs the village.

Both sorts of change whether as a result of agricultural expansion and development, or of urban spread, while producing regional variations upon the basic theme of the village, suggest that ultimately the settlement affected will pass out of the category of village. Other regional nuances are of an historical order but their diversifying factor is no longer operative. In North Auckland, for instance, coastal access and coastal traffic have played a more important role than elsewhere in the development of the village. In Westland the influence exerted by the gold mining period cannot be ignored in some villages, and their histories were often more than usually turbulent and even a little grander. The development of the village in Canterbury has been influenced by its close association with a sheep farming region once divided into large and extensive properties and now subdivided into more intensive units. In addition to the usual village forms in Taranaki there are settlements consisting of a dairy factory and post office store, a church, a hall, spaced out over half a mile. Or one finds a nucleus of general store, milk bar, garage, dairy factory and associated houses, but the school is half a mile away in one direction and the church hall half a mile in the other. Some of these settlements are clearly not to be classified as villages, but the

appearance of such discrete forms alongside the standard village forms cannot be ignored.

The investigation of such regional nuances will no doubt be a productive line of research; it will most certainly increase the understanding of the New Zealand village, and may modify some of the concepts put forth here. But at the present stage of research it seems that whether it is in North Auckland, the Wellington Province or in the Catlins district of Otago, the village displays the same form and function; and in all probability displays a characteristic pattern of evolution closely influenced by the changing technological and institutional life of the Dominion. It is to this aspect of the village, the evolution of the village community as it occurred in the Wellington Province, that we now turn.

THE PROGRESS OF SETTLEMENT, 1870-1910

The Wellington Province (and for brevity the southern part of the Hawke's Bay Province is included under this heading), was at the time of the first European settlement covered largely in podocarp forest (or bush). In the eastern part, however, two appreciable portions were covered with light bush and scrub or possessed a grassy open cover. From Napier to about Takapau and out to the coast lay the open plain and hill country of central Hawke's Bay, connected with the open country of the Wairarapa by a strip of country along the coast which allowed freedom of movement. The precise vegetational character of these open areas need not detain us; they were sufficiently clear to enable a swift and easy penetration of the area by large sheep graziers, who during the early 1850s occupied the Wairarapa and later, often by droving along the coastal route, occupied the Hawke's Bay region. As a consequence the existing physical contrasts between bush country and open country were reinforced by economic and social contrasts, which are still discernible. The open country became the domain of the large sheep graziers, who in many cases held the land originally under pastoral lease but later converted it to freehold. They were often men of substance, education and political influence, and many early families still retain their connections with the area. From such areas the Dominion draws some of its social elite. The bush areas remained largely unoccupied until the middle 1870s when settlement commenced. It took approximately twenty-five years to complete and it is in association with this settlement that the village is most closely connected. The bush was settled by men possessing no capital or very little capital, who received in one way or another assistance from the government. It was a more anonymous form of settlement and those close relationships between family and property apparent in the open country are not so evident in this area.

The contrast between the development of the bush and the open country is brought out by the map showing land owned by Europeans in

1878 (Fig. 1). The settlement of the open country in both the Wairarapa and Hawke's Bay is apparent, as well as the early settlement around the Wellington Peninsula. By 1878 the first phase of developing the bush of the Manawatu district had commenced. Some settlement had occurred around Marton in the middle 1860s, but most settlement occurred after 1870, mainly under the auspices of settlement associations who had acquired the land from the government. Quite as striking is the map for 1890 showing the distribution of large properties; the cluster in Hawke's Bay is obvious, as is that in the Wairarapa, and it is possible to discern holdings sited along the coastal route between the two districts. This map is suggestive of the social distinction between the bush and open country areas (Fig. 2).

The Influence of the Environment upon Settlement

Quite diverse reliefs were included within the bush and open country and these variations in relief not only divided the Province into a number of physical regions, but influenced the settlement of the region. It is customary to describe the physical geography of the eastern part of the Wellington Province as composed of a backbone of greywacke mountains trending N.N.E. which are separated from a lower but wider belt of hill country in the east by a vale which is itself dissected by a number of rivers following the same trend as the main range. Thus in Hawke's Bay the descent is from the bush covered Ruahine Range, across the flat alluvial plains about Takapau to the hill country, which consists in very general terms of a series of homoclinal ridges. Similarly near Pahiatua, the descent is from the Tararua Range across the small valleys of the Mangahao River and its tributaries to the relatively high range of the Puketoi (2,000 feet), and to the extensive eastern hill country. The bush originally lay across all these diverse types of relief and the success of bush and village settlement was influenced by the character of the relief and the degree of accessibility it afforded. The railway lines were constructed through the lower lying bush areas between the greywacke ranges and the hills, so that the small bush farmer, of limited capital means, received the advantage of accessibility and the chance of getting his produce to market. Consequently small farming (i.e. dairy farming) was ultimately successful and the village form persisted. However, in the more rugged bush areas to the east, the cost of opening them up for sheep grazing was too high, and they were therefore left to be exploited by a number of small holders who were prepared, in the beginning, to lead a very narrow and self-sufficient life. But these regions possessed neither of the two conditions, accessibility and a relief suited to dairy farming, necessary for the success of the small farmer. Consequently village settlement did not persist to any great extent in these areas, and these eastern parts now contain the sites

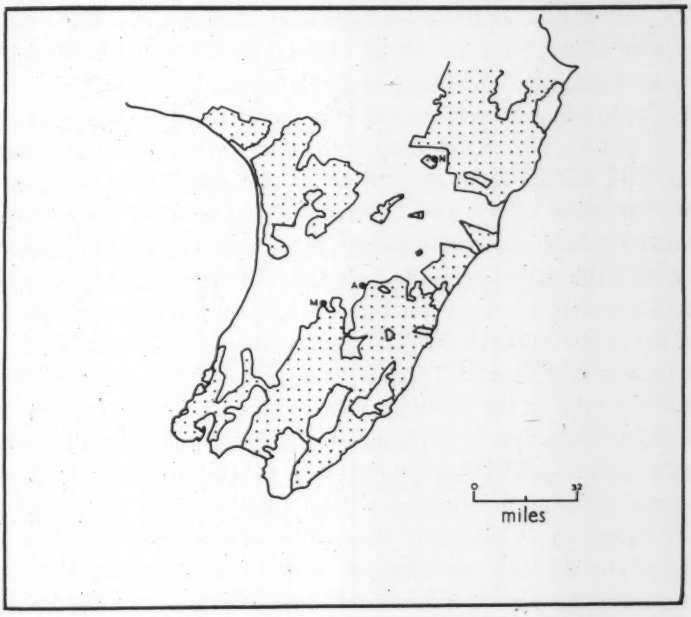

Fig. 1. European Land 1878
A: Alfredton M: Mauriceville N: Norsewood

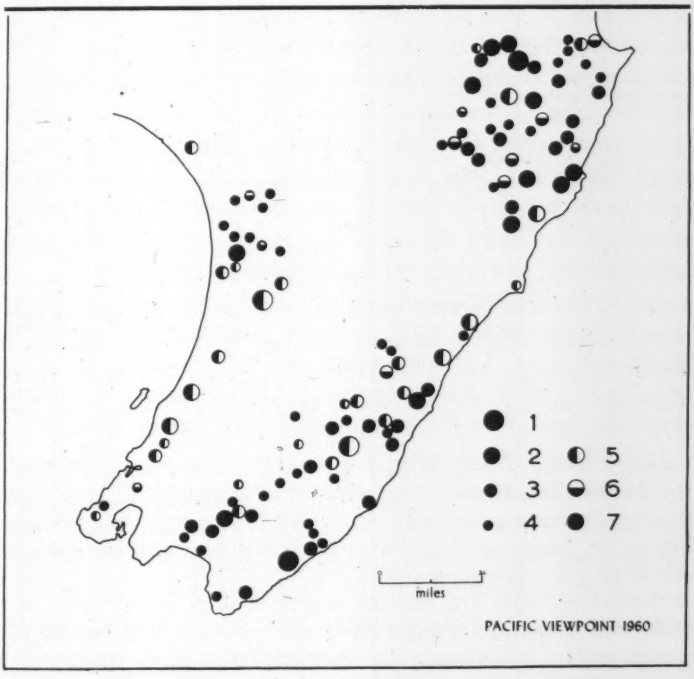

Fig. 2. Properties of 5,000 acres or more 1890.
1. 40,000 acres or more 2. 20,000-40,000 acres 3. 10-000-20,000 acres 4. 5,000-10,000 acres 5. Company properties 6. Absentee owners 7. Private properties.
Most of the company properties in the Horowhenua belonged to the Wellington-Manawatu Railway Company and consisted of undeveloped bush land.

of many villages completely or partially abandoned. This bush land having been cleared by the small farmer was later converted to sheep farming and the small holdings aggregated into large units.[7]

One should not however be led into the error of assuming that village settlement is found in association with dairy farming and not with sheep farming. The village form of settlement was essentially a means of developing the bush areas, and consequently it is most common in what were formerly bush covered districts; but if the area has remained in dairy farming then the density of villages tends to be greater than if it has been adopted for sheep farming. One may draw upon the areas around Kimbolton and in the Rangitikei valley to illustrate this qualification. Both districts belong to that vast area of Tertiary mudstones and sandstones that forms the inner hill land of the Wellington Province to the west of the Ruahine Range. The landscape is a maturely dissected one, the hill tops being reduced characteristically to long narrow ridges from which steep slopes fall to large and small, often very deep valleys which frequently display marked terracing. Along the Rangitikei River itself the terraces are impressive, broad and continuous. The broken terrain and the deep valleys render movement difficult and make for inaccessibility, which the original bush cover tended to accentuate. Such areas were settled under legislation which utilised the village as a form of settlement and provided for the assistance of men of small means, many of whom were defeated in the end by shortage of capital and high costs of transport. With some notable exceptions sheep farming became the dominant mode of land utilisation. Because of the distance from larger centres, and because of the need for some centre for social activities, villages such as Hunterville, Mangaweka (both aided by being sited on a railway line), Kimbolton and Apiti have persisted. Other villages such as Rata, Utiku and Rangiwahia possess dairy factories and act as centres for local dairy communities as well as for the sheep farming community.

Before 1870 the bush areas, apart from a few Maori settlements, were largely unoccupied (Figs 4 and 5). In the Wairarapa the bush towns of Featherston, Greytown, Carterton and Masterton were established during the late 1850s but they were closely associated with the sheep

[7] Mr Kavanagh in his Report divided the village settlements into two classes: "(1) Those which are situated conveniently to the main roads and railways and well served and opened up by dray roads; and (2) settlements which are remote from centres of population, and in addition are only accessible by means of indifferent dray roads and horse tracks.
"The settlements in class one may be described as being examples of industry and thrift, supported and prospering mainly by dairying; whilst class two encompasses settlers struggling under great difficulties, drawbacks and hardships to bring their holdings into profitable occupation, although they have not as yet received any return for their outlay . . . (they) complain of incomplete and indifferent roads and the inconvenience caused by their absentee neighbours." (A.J.H.R. (1899): C.1.14.)

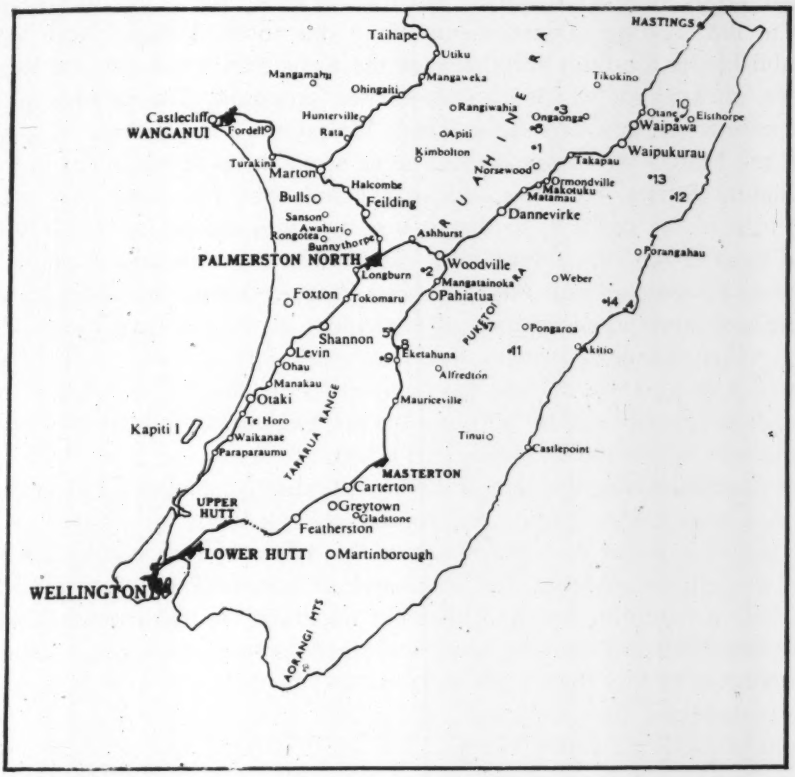

Fig. 3. Location Map.
1. Ashley Clinton 2. Ballance. 3. Blackburn 4. Herbertville 5. Hukanui 6. Makaretu 7. Makuri 8. Newman 9. Nireaha 10. Patangata 11. Rakanui 12. Wallingford 13. Wanstead 14. Wimbledon

farming of the region upon which the economy was fundamentally based. In the Horowhenua and Manawatu settlement was restricted to the coastal regions, being located about important Maori centres like Waikanae and Otaki, or around the port of Foxton, or in the Marton district where a light bush cover and good transport facilitated settlement. After 1870 bush settlement commenced in three areas: the Manawatu which was soon linked by rail to the ports of Wanganui and Foxton; the Dannevirke region where settlement was stimulated by the southward extension of the railway from Hawke's Bay and the port of Napier; and the northern end of the Wairarapa, where again the preparation of road and rail routes was the main stimulus to settlement.

During the period 1885-1894 settlement was again concentrated in three main areas. The development of the railway line through the Horowhenua, by the private enterprise of the Wellington-Manawatu Railway Company (all other lines were state ventures) led to the establishment of numerous villages beside the railway. The extension of the

Main Trunk line from Marton northwards along the Rangitikei River led to the creation of settlements along this route. Villages were also established in the bush area between the Rangitikei River and the Ruahines, an area for which no railway was proposed. The promise of a rail connection between the northern Wairarapa, the Hawke's Bay line and the Manawatu Gorge created some speculative development in the Pahiatua district. However, this connection was not completed until the turn of the century, so that it was not until the period 1895-1909 that most of the village settlement occurred in this area and in the hilly land to the east around Pongaroa and Weber. During the same period there was some intensification of settlement in the northern Manawatu with which village settlement was associated. The opening of the Main Trunk Line in 1908 marked the completion of village settlement in the Rangitikei district and for all purposes marked the termination of village settlement within the Province as a whole.

It appears from inspection of the census material that the 1901 census gives a reasonably accurate and reasonably full report of village populations. This is not surprising because it was at the turn of the century that the villages achieved their maximum importance, and after so much legislation regarding village settlement no doubt the Government itself was interested in obtaining some statistical picture of their evolution.[8] Settlements of less than 1,000 persons are mapped in Fig. 6, and with few exceptions they represent settlements which then and still today could properly be called villages. The most striking aspect of the map is the way in which it suggests the close relationship between the distribution of former bush areas and the distribution of village settlement. In those few cases where settlements are shown outside the old bush areas they are either long established centres which later grew to the size of boroughs, or they are villages such as Tinui and Porangahau situated in the remote parts of the eastern hill country.

One can distinguish in Fig. 6 five regional groupings of villages. The first group, around Norsewood, is associated with the northern half of the Seventy Mile Bush.[9] The second group is very numerous and is associated with the southern part of the Seventy Mile Bush around

[8] Total populations for many villages are reported at each census, but because the definition of the village's limits rests with the local enumerator changes in population reported from census to census are as liable to reflect changes in definition as much as real changes. This becomes obvious when the reported population of a village is compared from census to census. Furthermore at some censuses the enumerator has not necessarily been required to record village populations so that the completeness of the data varies from time to time.

[9] The Seventy Mile Bush customarily referred to a tract of bush country lying between Mauriceville in the south and Norsewood in the north. The Forty Mile Bush referred to the same tract of country between the settlements of Mauriceville and Woodville.

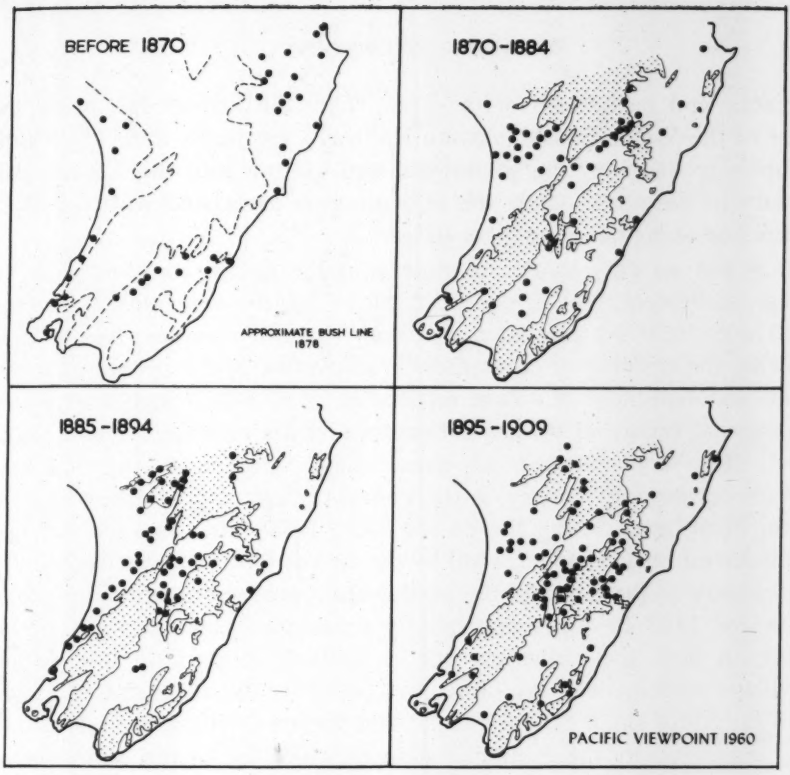

Fig. 4. Post Offices opened (land over 1,000 ft stippled).

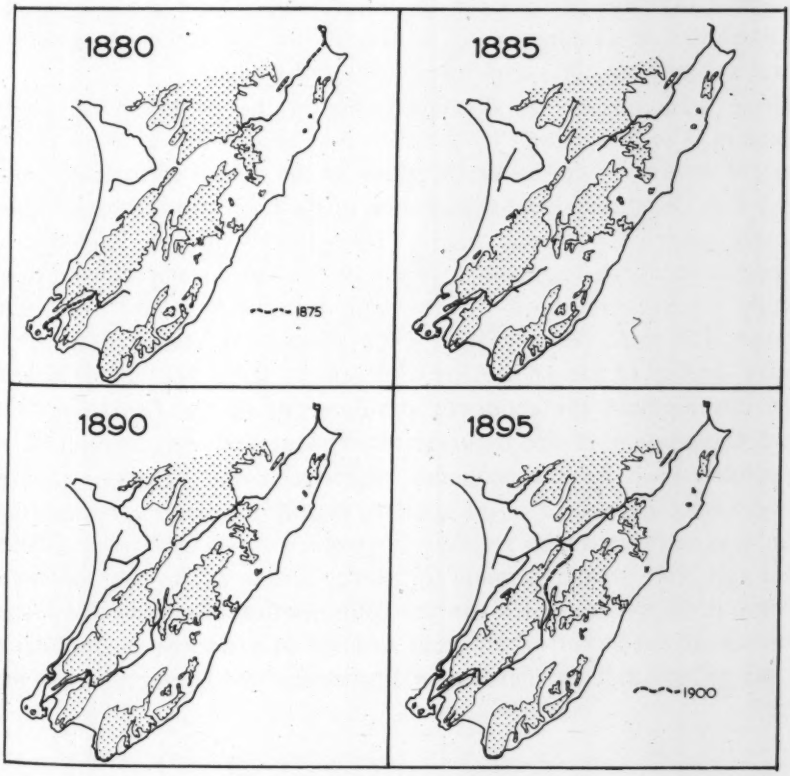

Fig. 5. Development of Railways.

Pahiatua and eastwards to Pongaroa. The third group lies along the route of the Wellington-Manawatu Railway Company's line. The fourth group is spaced over the Manawatu and extends into the Tertiary hill country to the north, while the fifth group is associated with the Main Trunk line along the Rangitikei River.

It is not an easy matter to document the decline or the failure of village settlement, but if the post offices which were closed between 1914 and 1930 are plotted a significant pattern emerges. As the map showing the opening of post offices is suggestive of the spread of settlement, and especially of village settlement, so is Fig. 7 suggestive of the decline and failure of village settlement and the reversal of rural settlement. The concentration of post offices closed in the Pahiatua district corresponds closely to the concentration of post offices opened in the same area during the period 1895-1909, and the concentration of nucleated settlement recorded by the census for 1901. Similarly in the hill country to the north of the Manawatu, openings recorded for 1885-1894 and 1895-1909 are matched by a cluster of closings during 1914-1930. In both these districts one is inclined to attribute the decline in village settlement to the difficulties posed by the environment for the bush farmer of small capital means. The decline in village settlement was also influenced by the economic changes which led to the centralisation of the population; the development of motor transport being one important aspect of these changes. In the Manawatu, where a third notable concentration of closings is to be found, the influence of economic change rather than the environment was pre-eminent.

Three main phases are distinguishable in the evolution of village settlement. The first phase (1870-1895) may be considered as the period of establishment, when the development of the village was closely associated with the clearing and exploitation of the bush and the construction of route ways. The second phase (1895-1925) may be regarded as the period of stabilisation when largely due to the development of dairy farming a permanent basis for the settlement of bush areas was discovered. The third phase (1925 to the present) is associated with the relative decline of the village. In very general terms the village reflects in its development the economic development of the Dominion. The initial exploitation of the natural environment and the creation of an agricultural basis for the economy, which involved the apportionment of a considerable sector of the nation's capital and labour to the rural areas, was associated with a relatively greater rural density of population and a relatively greater demand for village services. The later period of national development which saw the centralisation of capital and labour resources in the larger urban areas resulted in a decline in importance for the village and an increase in importance for larger metropolitan cities.

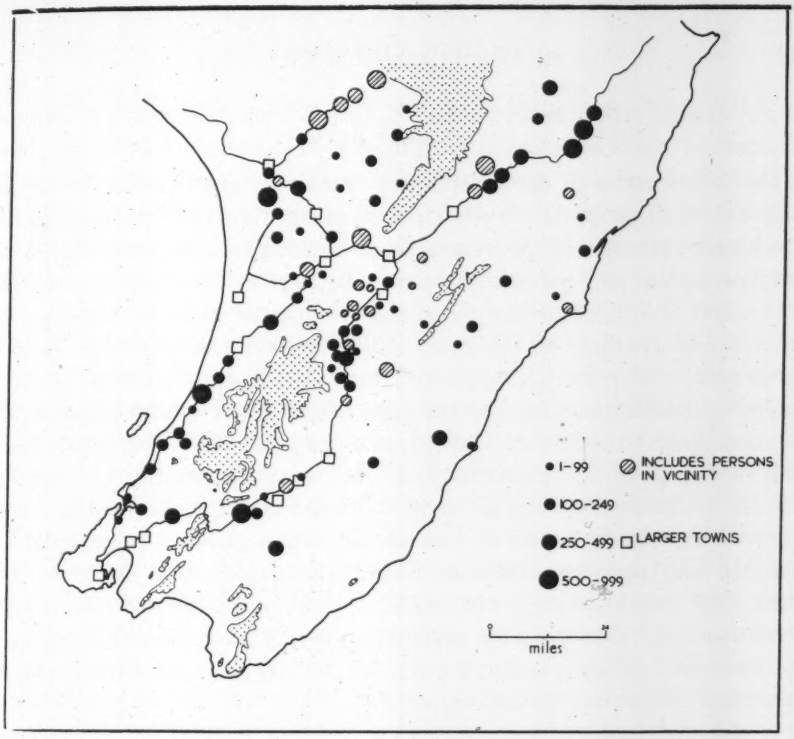

Fig. 6. Nucleated Settlements of less than 1,000 persons, 1901 (land over 2,000 ft stippled).

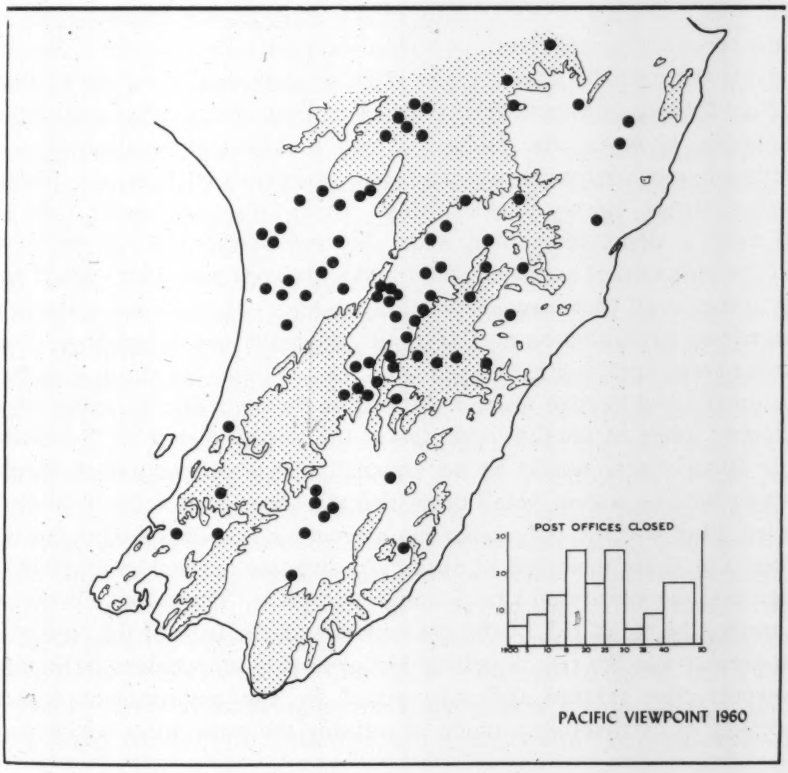

Fig. 7. Post Offices closed 1914-1930.

THE ESTABLISHMENT OF VILLAGE SETTLEMENT, 1870-1895

The bush areas of the Wellington Province represented in 1870 a huge extent of underdeveloped land isolating from one another the four developed parts of the province, those around the ports of Wellington and Wanganui, and the sheep grazing districts of Hawke's Bay and the Wairarapa. To those interested in the advancement of the Province the necessity of opening up the bush for settlement was obvious. Thereby the general and provincial government would discover a new source of taxation, the demand for the services of the ports would increase, the national wealth would be enlarged, and the lead which the South Island held in degree of development would be somewhat reduced. Above all, only in so far as the bush areas were settled could the European settlement of the North Island be considered successful and permanent. To instigate and encourage the settlement and exploitation of these bush areas four requirements were necessary: the elaboration of an institutional framework to promote settlement; the construction of route ways; the discovery of an economic basis for life in the bush areas, and the attraction of settlers to the areas.

The Bush

The bush was by any measure a severe environment. Within it movement was restricted by the density of the undergrowth and the steepness of the terrain. Natural clearings within the bush area were rare, although towards the east the cover was in parts lighter; and there were patches such as the site of Dannevirke which had been overrun by several fires. Generally, however, the foliage formed a thick and continuous mass overhead and contemporary photographs reveal bush tracks piercing sombre, dense, closely packed forests. Such an environment could and did exert a depressing effect upon the new settler, and a wet winter and the affliction of sandflies could make life very miserable. Apart from the timber itself there were few other resources in the bush suitable for immediate exploitation; and without tramways or railroads a timber industry was impossible. Once created, in one case, the sheer abundance of timber would prove to be a depressive factor in the economy of the industry; while in another case (as in the northern part of the Seventy Mile Bush) there would be an unusually large proportion of shrubby growth such as mahoe, small tawa, and tawhero, of no value to the sawmiller. Flax was the only other main resource associated with the bush areas. For those unskilled in bushcraft, and this applied to many of the migrants, the bush could be a dangerous place. There was always, for example, the small risk of the ignorant eating the fruit of the tutu plant; but greater was the risk of getting lost or having an accident in the bush. However, the greatest difficulty posed by the environment was the necessity of discovering a mode of utilising the bush areas which would

provide a sound economic basis for the permanent settlement of the bush. The initial response to this difficulty was conceived in terms of the immigrant's original European environment. The ground plans of the villages and rural sections reveal that a density of settlement of the order found in England and Europe during the late nineteenth century and a system of farming in which arable land remained important were anticipated. Those directing the settlement could hardly have planned otherwise, for the potentialities of the bush areas as live-stock areas remained obscure until the technological developments associated with dairying and refrigeration had occurred. Even then the realisation of these potentialities was relatively slow. The Hon. E. Newman was reported in 1927 as saying "The Kairanga Flats and the Kopane (Manawatu District). . . were within his recollection heavy bush. That was difficult to realise to day, but to his mind it was even more difficult to understand why the pioneer settlers of the period did not realise the vast potential value of this part of the country . . . It was not until the dairy industry was properly established that the grazing value of the Kairanga-Kopane was really realised even by the farmers occupying the territory. Consequently people were reluctant to purchase bush land when open country was available."

Legislation

The legislation passed to promote and establish settlement in the bush areas, whether it was passed by the Provincial or National Government, or drawn up by conservative or more radical parties, reveals a number of common features. Usually a block of land of twenty, fifty or one hundred thousand acres was set aside under the provisions of the current Land Act enabling the establishment of Special, or Village-Homestead Settlements and Settlement Associations. Such provisions would establish maximum size of holdings for suburban and rural sections, would prohibit "dummyism" or the possession of more than one section, would set the prices of the land, and arrange for the deferred payment of the cost of the section. The legislation was directed strictly towards the man of small capital means and away from the large landowner. Reflecting on the one hand the characteristic belief of the New Zealander in the benevolence of government, and on the other hand the problems posed by bush settlement and the inadequacy of many settlers, were the provisions which made the acquisition of the freehold dependent upon a number of conditions. Absenteeism was prohibited; improvements to a certain value had to be made over a stated period; and Rangers were appointed to see these conditions were carried out. The freehold was usually acquired after a period of five years. A number of villages were established as a result of the Land for Settlement Acts of the 1890s which were aimed at breaking up the larger grazier estates, most of them in the South Island; but Elsthorpe and Langdale are two examples to

be found in the Wellington Province. The government usually undertook the surveying and sale of the land, for most of the bush land was either Crown Land or had been acquired by the Crown from the Maoris. Consequently most of the villages in the Seventy Mile Bush and the Rangitikei and northern Manawatu were Crown settlements. In the case of the Scandinavian settlements (e.g. Norsewood) the government itself arranged for the immigration of settlers; but under the Ballance Government, in contrast, the establishment of village settlement in the Pahiatua district was not directly linked with any migration scheme. The relevant legislation also enabled the government to appoint agents, and in the case of the Manchester Settlement (Halcombe and Ashhurst) and the Douglas Settlement (Rongotea) private companies saw to the establishment of the settlement and to the acquisition of settlers. There are a number of villages which were established on private land and whose development was not influenced by this legislation. Some of them such as Tinui, Castlepoint and Porangahau are amongst the oldest villages of the Province and their growth was related to the early needs of the grazing community. Other villages, e.g. Tikokino and Onga Onga, were established by individuals, often sheep graziers, who had acquired bush country adjacent to their properties, and Otane and Takapau were established near patches of bush. These four all happen to have been successful and permanent settlements. But there was a tendency for some highly speculative settlements to be founded on private land[10]; so that when the Hutt Special Settlement Association Number 4 advertised its village settlement in 1896, it had to write, "Brownstown is not a bogus township, but a real place in which to live . . ." The pre-eminent role played by the State, with its first and rather rigid attempts at some form of town planning, was one of the main factors influencing the uniform character of village settlement in the Province.

[10] In its Twenty-Fifth Anniversary Supplement of 19th December 1930, *The Waipukurau Press* referred to Wanstead as a township consisting of a hotel, school, public hall and telegraph office. Originally, in about 1878, the township was laid out with 220 sections, with nine good sized streets one and a half chains wide, with reserves for a church, post office, court house, market and education purposes, and two unspecified reserves. ". . . so far as the records held by the Patangata County Council are concerned, the majority of the town's allotments are held by some forty-eight owners, many of whom are absentee owners, and are resident in Hastings, Napier, Onehunga, Auckland, Hamilton, Hawera, New Plymouth, Waipukurau and even as far abroad as England and Ireland." ". . . although many sections were disposed of at the (public auction 1878) it is doubtful whether some of the purchasers ever completed the sale by paying the balance of the purchase money, or whether they took the title or not." "One absentee owner writes to the county, 'I was through Wanstead in 1890 where there was no sign of a township. Has it made any progress since then?' "

Route Ways

There has always been a close connection between the development of village settlement and the development of rail and road. (For the villages of the Wellington Province sea transport was never of great importance.) The Government arranged in many cases that the village settlers would derive initially some income from employment upon public work, which would help to support them until their houses were built and some of their land was in production. Thus during the first year at Dannevirke the average monthly wage drawn from road work ranged from as low as £4 4s. to as high as £9 14s. 1d.; and some of the settlers at Norsewood were able to acquire the freehold of their properties with the money earned preparing railway sleepers. While the settlers prepared both bush tracks (often called lines) and road and rail beds, at a time when road transport was costly and slow it was the railroad that was of particular importance to the village which, taking advantage of its accessibility, would act as the transport centre for the surrounding district. The significance of the railroad to the prospects of the district and the village was not missed by the settlers or land purchasers. Such subjects as the siting of the railway station, or the routing of the line, or the timing of development would arouse intense local interest, and at times produce much contention. The citizens of Pahiatua, a private settlement, went so far as to accuse Mr Ballance (the Minister of Lands and Immigration) of re-routing the line so that his (i.e. the Crown's) settlement and not Pahiatua would benefit. At Dannevirke, a Crown settlement, villagers bitterly criticised the government for establishing the railway station a considerable distance away from the main body of settlement, in order that the value of the adjacent block of land, which the government still owned, would thereby be enhanced. Frequently the promise of a railway line was used for bait for settlers and land purchasers and much speculation resulted from it. As late as 1912 there was agitation for a new line to be laid through the eastern hill country which would connect the villages of Weber, Pongaroa and Alfredton with the Hawke's Bay and Wairarapa lines. The disappointment of the early settlers of Apiti and Tikokino when they discovered they were to be left without a rail connection is still echoed today. One of the first things related to the visitor in both places is that a railway line was intended to pass through the village. This information is offered, covertly, as an explanation for the village's inferior economic status, and it carries with it the suggestion of great chances missed. These popular legends are based on nothing more than an exploratory survey through Apiti for the Main Trunk line, and the Hawke's Bay Provincial Estimates of 1874, which included a grant-in-aid for the Tikokino tramway. That the memory of such blasted hopes should

persist for so long serves to emphasise the very real importance which rail development had in village affairs. The majority of the villages, however, were sited along the railway, and for a few villages the railway had an especially great influence upon their development. Ashhurst, for example, which controlled the western end of the Manawatu Gorge, was the base for an important construction camp; and Mangaweka acted as the main camp while two costly and large viaducts were constructed for the Main Trunk. Any village which happened to be at the end of the track for a period of time enjoyed a burst of prosperity.

For those settlements which were solely dependent upon road transport the question of accessibility assumed an overwhelming importance; and often it was by forming Road Boards, which could levy rates for roading purposes, that the first ventures in local government were undertaken by the settlers. Before adequate roads were constructed pack horses were used and then with roading bullock drays and horse-drawn coaches became popular. However, the villagers could expect to be isolated for some part of each winter because of the bad state of the roads, and if they were unfortunate enough to have a grasping storekeeper they could expect to be fleeced too. Under any circumstances freight was extraordinarily costly. The condition of the roads was a frequent cause of petitions to the government, and it was cynically observed that while there was money enough for road works before every election, afterwards is always seemed to disappear. Some of the wryest humour of the period is concerned with the state of the roads. Bad roads exercised a crippling effect on village development, and as one member of a special settlement association observed before the Royal Commission on Land Tenure in 1905, the conditions of the roads influenced every aspect, economic and social, of bush life. He pointed out that an illness in the family might cost a settler the equivalent of one month's wages in doctor's fees, and that every young man who took up land in the bush ran the risk of his intended refusing "to come and be buried in the backblocks".

Economy

The income of the village during this initial phase of establishment was drawn from five main sources: sawmilling, flaxmilling, public works, agricultural pursuits and trade. It is impossible to assess with any accuracy the contribution made by each sector, which in any case would vary from village to village. In some settlements sawmilling or railroad employment would be of outstanding importance while in others an almost completely self sufficient agricultural economy would prevail. In the majority of cases, however, the income from any one activity was never assured and many villagers engaged in a number of activities. When employment was scarce in the district it was not uncommon for some of the men to migrate in search of jobs, leaving their wife and family to tend the section. A necessary distinction needs to be made between

sawmilling, flaxmilling and public works as a source of income, and agriculture and trade, for the economic importance of the first group of activities was destined to decline. Sawmilling was a purely exploitative form of economy competing with agriculture in the race to destroy the bush; as the land was drained for agricultural development, the flax industry was driven out; and inevitably the great period of public works had to pass and the group of labourers who brought so much trade to the village either dispersed or passed on to some remoter region. Only agriculture or trade could assure a stable economic basis to village life.

The information available for the sawmilling industry is inadequate. It was by nature a transitory sort of economy associated with few permanent settlement forms and a markedly male population. Such conditions were not conducive to the collection or preservation of records. Only when the sawmilling industry is in decline is it possible to obtain a statistical and locational picture (Fig. 12). In 1907 the mills grouped themselves in two areas, between Norsewood and Woodville, and in the western part of the Pahiatua district. A few were to be found in the Horowhenua, the northern Manawatu and in the bush areas close to the eastern Ruahine. Despite the paucity of information it is safe to generalise that sawmilling influenced the development of the village in many parts of the bush. During the late 1870s eight sawmills were operating in the vicinity of Takapau, and the industry played an important role in the economy of Tikokino. In 1880 the timber trade at Halcombe was reported to be suffering, and about the same time eight mills were located near Makotuku and several more around Ormondville. By 1910 it was recognised in Matamau that the industry was fast drawing to a close. The significance of the timber industry to the economy of the village is revealed by a Dannevirke correspondent who wrote, "When bush felling work is plentiful this forms by no means an unimportant source of income to local traders". The industry was not, however, of equal importance throughout the bush areas because of the variations which existed in the quality and quantity of millable timber within the bush. Many commentators agreed that especially fine stands of totara existed in the vicinity of Ohau; but in the main the bush of the Horowhenua consisted of red and white pine or matai. Near Ashhurst and on the western slopes of the Ruahine valuable stands of timber occurred, often including extensive areas of totara; and very valuable totara bush was reported near Dannevirke, Tikokino, Takapau and to the south of Pahiatua. In contrast the reports concerning the bush in the southern part of the Seventy Mile Bush were unfavourable. In the Mauriceville area there was barely enough timber suitable for fencing purposes, and in the Mangaone and Pahiatua Blocks there was no timber available suitable for sawmilling in sufficient quantities except rimu. To the east of Dannevirke the Tautane Block was largely in manuka, toi toi, flax and light bush. The progress of the flax industry

is as poorly recorded as that of sawmilling. Its greatest development occurred in the Horowhenua and the lower Manawatu, and it was often reported in the vicinity of Takapau. The drainage of the swamp land and the onset of a disease amongst the plants led to the decline of the industry during the 1890s.

Frequent efforts were made to extend the utilisation of the rather meagre resources of the bush area. Alongside sawmilling developed the petty industry of splitting fence posts and even splitting firewood. Charcoal was burnt for the Spit Freezing Works at Makotuku, and a market was found for potash. The fungus growth which appeared on the trees after they had been felled and was enjoyed by the Chinese and Maoris provided a source of income for the settlers of the Seventy Mile Bush, as in Taranaki. But the greatest hopes always were founded upon the discovery of mineral deposits. Coal (lignite really), discovered near Norsewood and near Apiti, was widely advertised, and the small Maharahara copper mine sucked up much local capital. Near Alfredton an oil drill went as deep as 3,000 feet, "with good indication", but the company's last thousand pounds was spent on a law suit.

Under the conditions of the Orders in Council or the Articles of Association which established the settlement, the settler who wished to obtain the freehold of his section was often required to maintain a steady rate of improvement; such provisions were largely in accordance with his own desire, for to meet the annual payments to the Crown at least, some return from the land was to be hoped for. The majority of settlers like those at Blackburn, Ashley Clinton and Makaretu managed no doubt to "jog along". They grew wheat, oats, barley, potatoes and fruit, and kept a cow or two. In the bush there was always the chance of shooting wild pig or wild cattle, bush pigeon, huia or pheasant, which would supplement the meat diet or income. Eels were to be caught in the streams. But to produce something that was saleable was difficult. Butter might be sold to the store, but it varied greatly in quality and edibility and by early summer was liable to be in over supply. Grass seeds were eminently marketable and were to provide a source of income for settlers of Pongaroa, Makaretu and the Pahiatua Village Settlement. Where sheep or cattle could be run on bush-burn the wool, hides, tallow and skins were exported from the district. On the whole, however, the picture that one obtains of agriculture during this initial phase is not a prosperous one. On the eastern margins of the Ruahine the settlers "managed to exist because there are few of them. They use their sections as a home and easily get employment outside during from three to six months in the year. But they cannot and do not sell their produce". By 1880, i.e. in the eighth year of settlement, the 600 people of Norsewood were reckoned to have 1,600 acres in grass and crop, 400 milking cows and 600 head of cattle, 150 horses. Twelve years later "only a very few settlers have, after sixteen to twenty years of struggle, more than ten

to fifteen acres under the plough". The process of selling out was under way and deserted buildings marked the site of former homes. The villagers in the settlements around Pahiatua were in 1887 without money to carry them through the winter and for requiring credit they were charged twenty-five per cent more for wire and flour and fifty per cent more for other commodities. A settler at Pongaroa explained in a letter to the *Woodville Examiner* how people in the district had been deceived by the quality of the land, which made the holdings, as they were cut up, uneconomic. For himself, he was prepared to "sling this" and go bullock driving.

The relatively slow progress made by agriculture is not difficult to understand. The bush settler was essentially a man of limited capital means and this together with the poor accessibility and the absence of markets helps to account for the slow improvement of farming. Too frequently the settler expended his scanty capital in the purchase of the land and the necessary tools and stock. Once his house was built he might leave the section in charge of his wife while working at his old occupation. The charges incurred for stock and mortgages were often burdensome and it was observed at Norsewood in 1881 that too much ready money was being sent out of the settlement to repay interest. At Halcombe during the previous year it had been recognised that what the district required was ". . . a few men who can afford to clear the land, to fence it and to grass and stock it. . . . The great mistake . . . has been in selling the land to people that cannot use it for want of means." However, more than money capital was involved in clearing the bush. Too often the survey pegs did not exist and until they were in place improvements were naturally delayed. The individual settler was closely dependent upon the action and co-operation of his fellow men in such matters as fencing and clearing. Moreover, until the adjacent sections were burnt off no settler could take the risk of making improvements to have them subsequently destroyed by fire; and if too many sections of the village remained unoccupied the cost of fencing, which could not be shared with neighbours, became prohibitive, and the standard of farming consequently suffered.

The Settlers

Finally, one must refer to the character of the settlers themselves as a factor hindering development. This is a difficult matter to discuss because it runs contrary to the popular conception of the pioneer; and the eventual success of village settlement is liable to be taken as evidence and proof of the ability and tenacity of the pioneers, a view that totally ignores the turnover in settlers which must have occurred. If it were true that most settlers were suited to the task, it is also true that a proportion, whose magnitude we shall never be able to assess, were not suited.

Men like R. Disher (twenty-nine years of age, six feet high, strong, very abstemious, a colonial by birth, married), and James Moore (thirty-three, very strong, a native of Wellington, very abstemious, married, three children) who wrote to their local member of Parliament asking for land at Pongaroa, no doubt made fine settlers. For they said they were shearers, fencers, drainers, bush fellers, grass seed sowers, accustomed to dairy farming and also sheep farming. And the married men who were working on the Alfredton Weber Road and wished to settle at Rakanui, no doubt knew the land and possessed the necessary skills. But when Mr Halcombe the agent for Manchester Settlement saw the immigrants who had arrived by the ship *Douglas,* he told the ship's surgeon he thought them a "mangy lot", and considered them as a body to be physically unfit for colonial life. The surgeon reports, "He gave them all the encouragement he could to stay away from the Block". A correspondent at Norsewood thought it lamentable to see unfortunate butchers, tailors and joiners making fruitless efforts to use tools they had never seen before. Eight months later two cabinet makers, two weavers, a wheelwright, carpenter, joiner, bricklayer, dyer and common labourer were listed as having left the settlement. Of the forty males who had arrived by certain ships and were destined for the Manchester Block, only eleven gave their occupation as farm labourers; ten were classified as sawyers; the rest followed non-agricultural pursuits. At Newman, founded in 1886, sixty of the eighty-one land purchasers gave their place of origin as Wellington City—hardly suggestive of agricultural connections—and of the seventy-one who gave their occupation, thirty-four designated themselves vaguely as settlers, the rest were all specifically non-agricultural in calling, with not one listed as farmer or farm labourer. Of the thirty-eight male members of the Brownsville (Hukanui) settlement, thirteen described themselves as farmers, seven as settlers, eighteen were specifically non-agricultural. At Kimbolton in 1888 of the seventy males who purchased suburban sections thirty-three called themselves settlers, eleven were farmers and twenty-six followed non-agricultural occupations. Of the seventy-eight who purchased rural sections, while thirty-nine described themselves as farmers, thirty still returned non-agricultural occupations. Such figures are suggestive of the difficulties which arose out of the origins and past histories of the settlers themselves. One cannot press this point too far for the evidence is very fragmentary; comparatively little is known about the people who settled the bush; it was characteristically an anonymous type of settlement.

Towards the end of the 1880s, i.e. as the phase of establishment drew to a close, it is possible to piece together a picture of the number and range of services provided by the village. Each dry season the settlers would burn off the bush, and then huge cumulus-like clouds of smoke would dominate the skyline. Occasionally following an unexpected

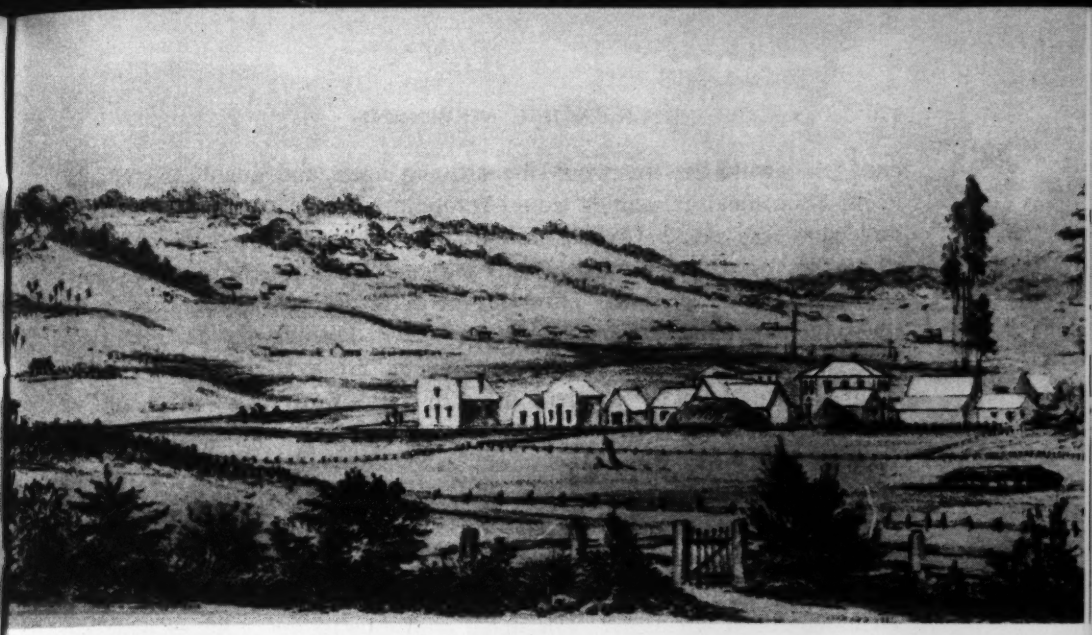

Photo: Turnbull Library

Fig. 8. Halcombe c. 1878, looking W.N.W. Some remnants of the original bush cover are left standing near the village centre. The homesteads can be seen set out on their one or six acre sections.

Photo: S. H. Franklin

Fig. 9. Halcombe 1960, looking S.W. Because retailing is highly restricted during the week-end Friday is the principal shopping day, and, as on this Friday afternoon, increased activity is registered around the stores.

change of wind the fire would bear down upon and engulf the village itself. Such local calamities would result in a listing of what was burnt and what was saved. Correspondents often commented, respectfully or ironically, on the progress of the settlements. They were often, one suspects, members of the more powerful grazier class who had both the time to travel and the education which engenders such enquiries. Descriptions covering a range of settlements are available; they include villages located in the northern parts of the Seventy Mile Bush and in the eastern and southern parts, and there are descriptions of villages situated along the Wairarapa coast and, like Tinui, closely connected with the sheep grazing community. Some were private, most were government settlements. The school, post office, store and church, these were, as today, the basic services of the village, the common nucleus of services. Beyond these services the smaller village like Makaretu and Ballance could not aspire. The usual additions to this nucleus were the hotel, the local hall, the public library and the blacksmith, and such additions distinguished the larger village like Norsewood and Tinui from the smaller. What other services were provided varied with the circumstance, but the relatively greater economic importance of the village during this period is indicated by the appearance of tailors, bootmakers, chemists and even watchmakers in the village and the relatively greater decentralisation of services is signified by the presence of the police station, courthouse, doctor, baker and solicitor.

The role played by the village during the period 1870-1890 was a critical one in the development of the bush areas, for essentially the village was one of the principal means of opening up that country. It was the centre which housed so many of the public works employees and so many of the sawyers and flax millers. It acted as the immediate social, commercial and transport centre for the surrounding district. It was the first contact between the bush settlers and the outside world. Above all it was a training ground for bushcraft, it was a schooling place for the bush dweller. "They are unacquainted with the timber . . . and they do not know which kind of wood will suit their purpose, and if they did it is doubtful whether they would know which would be likely to split well, as they (the timbers) have characteristics which can be acquired by long experience and minute observation" (Norsewood). "Their utter ignorance of the character of the land made them select the worst, or be discontented with the best sections" (Manchester Block). It was essential to the success of bush farming that the settlers were at first kept together in the village where they might obtain income from other sources whilst they learnt farming and how to deal with the bush. Furthermore, to have allowed them to disperse to individual holdings would have made supply almost impossible. Once out in the bush and separated people easily lost their way and became dispirited. As Halcombe wrote, ". . . the bar to the occupation of the land which

even half a mile of thick bush presents will be recognised by any practical man".

THE STABILISATION OF VILLAGE SETTLEMENT, 1895-1920

Economic Changes

The second phase of development may be regarded as a period of stabilisation, during which a more certain and more enduring economic basis to life in the bush areas was secured. Technological and institutional innovations in the dairy and the sheep farming industry all tended to favour and assist the smaller farmer; this in turn stimulated the development of the village. During the period 1895-1920, particularly in the North Island, great advances were made towards a more complete utilisation of the Dominion's agricultural resources. Not until after 1911 did the percentage of the population living in urban areas exceed that living in rural areas. There was then, relatively speaking, a greater proportion of the total population and the total labour force dispersed throughout the countyside and consequently there was a relatively greater demand for services to be supplied in the rural areas. At a time when road transport was severely restricted, the village favourably located on the railway line continued to act as the natural focus of transport for the surrounding district, but prospered even more as the numbers of stock despatched to the freezing works rose and the volume of wool, butter and cheese loaded for the ports increased. It is not surprising, therefore that the most vigorous phase of village life coincided with this favourable conjunction of economic, technological and demographic factors. Significantly during this second period the distinction between the village community and the surrounding rural community became more marked, as the agricultural aspect of village life declined in importance, and as rural settlement extended well beyond the immediate vicinity of the village.

A discussion of the improvements made in the dairying and sheep farming industry belongs essentially to the study of their evolution rather than to a study of the village community. But a number of aspects require mentioning because of their influence on village life. During the late 1890s the newspapers contained a large number of references, often very brief, to the formation of dairy companies in many parts of the bush area. At Pongaroa in 1899 the farmers, when discussing the establishment of a dairy factory, recognised the need for improved roads as a concomitant of success. The following year the prospects were investigated by a Wellington freezing company (and so for that matter were the prospects of a light railway from Masterton); nothing eventuated in either case. From Apiti in 1895 it was reported that a dairy factory was to be built the following year, and the settlers at Ormond-

ville about the same time resolved to establish a butter factory. At Weber, too, they had hopes. At Norsewood, a co-operative dairy factory was established in 1887; two years later one was opened at Mauriceville. By 1897, factories or cream separator stations had been established at Maharahara, Ballance, Kaitawa, Mangatainoka, Nireaha, Halcombe, Rongotea. Such list of dates and place names gives some idea of the spread and timing of these events. The siting of the dairy factory within the village established a characteristic feature of village routine, the daily ingress and egress of the farmers bringing in their cream and milk—a feature still persisting in some parts (though an early rise is required to see it) but now largely vanished with the advent of the milk tanker. These daily visits served to strengthen the economic relationship between the farmer and the village, and on late shopping nights both men and women would come to spend part of their increasing income. The dairy factory brought not only a new industry to the village but also added to its role as a social centre, for it was to the village that the dairy farmers came to discuss the affairs of their co-operative institution, or to listen to lectures on the processes and the problems of this new industry. The problems which had to be faced offer one more example of the inadequacy of some of these settlers for rural life; an inadequacy which was overcome as knowledge was disseminated, the bush cleared and the exotic pastures established. F. W. B. Greville commenting in 1890 on the dairy industry in Wellington Province said, "I find there is a total absence of information and knowledge about dairying, indeed a general ignorance of the general principles of dairy making . . . There is an invariable absence of the necessary cleanliness, it is common practice of both men and women to milk without washing either their own hands or the cow's teats. The result is that the milk is dirty."

The development of refrigeration made possible the intensification of sheep farming, so that in addition to the income from wool, skins and tallow, the farmer found another profitable source in meat. Consequently sheep raising became economical on holdings of a size within the financial range of a man of limited capital means. In the former bush areas of moderate relief the establishment of fat lamb farming was possible, whilst in those areas of more marked relief, the production of wool and store sheep for the lowland fat lamb farms formed the basis of the economy. In this manner a certain degree of stability was achieved in the settlement of those areas less suited to dairy farming. Added to this technological factor was the legislation of the Liberal-Labour Government which by its Land for Settlement Acts, either bought up large sheep grazing holdings for subdivision, or because of the implication of the legislation stimulated other large holders to undertake their own subdivision. These events led to an increased density of settlement in some areas, with beneficial effects on certain villages. Thus Elsthorpe was

known as a government town, its establishment in 1896 occurring in conjunction with the cutting up of the estates in the vicinity. Hatuma and Langdale had similar origins though neither has persisted as a village. The government's subdivision of the Argyle estate, which was immediately adjacent to Tikokino, and the Forest Gate Settlement, which was immediately adjacent to Onga Onga, favoured greatly the growth of these settlements. In the case of Onga Onga, fresh life was given by the private subdivision of the Mt. Vernon estate in 1905. Otane, founded in 1874 in association with the sale of 10,000 acres from the Homewood estate, would, it was hoped, receive "that impetus for which it has long been waiting" when, as late as 1920, 3,500 acres from two nearby estates were subdivided. It never did receive that impetus, for with the influence exerted by the motor car in the years immediately following, much of the trade of the new land owners was lost to the adjacent larger towns. When subdivision did not occur or was tardy the effects, though negative, were still felt. At Norsewood in 1898 the settlers were cramped by an adjacent block of native land held in unprofitable occupation. And six years previously they had agitated for the acquisition by the government of an 11,000 acre block which a well-known and politically influential runholder refused to sell.

Social Life

The improvements in economic conditions were matched by a certain expansiveness in social life, and the village came to display, as it still does, a full though neither diversified nor intense social life. By 1895 the pace of life in Rongotea at least could be described as fast. "First the Plymouth Brethren were seen at an early hour running here and there with cups and saucers and dishes of various kinds, all going to the Temperance Hall, preparing for the requirements of the day, body as well as soul. An 'all day' meeting was in hand, which came off in the usual manner, and the Gospel Preacher in the evening. Next in order came the Primitive Methodists with the Sunday School picnic and then in the evening at the Primitive Church, the Rev. J. Cocker conferred the third degree on some members of the Excelsior Lodge of Good Templars; after which a public meeting took place in the same church when the Rev. J. Cocker gave a lecture on 'Books and Reading'; and some of the children gave recitations and then Mrs Cocker handed to the scholars the prizes awarded in the school for the past year. Another picnic eventuated at Mr A.'s but of a private and select kind . . ." From the earliest days of settlement both the school and the church had acted as centres for social life. The absence of an established Church, the popularity of non-conformist sects during the nineteenth century, and in a few cases the religious individuality of the Scandinavian settlers, underlay the multiplication of church buildings in many villages. Rongotea could boast six; many of the other larger villages possessed three

or four churches. Religious toleration was apparently widely practised in these communities, although the Lutheran churches suffered in Rongotea and Halcombe during the first World War owing to their supposed German sympathies. The schools were largely state-controlled, their wooden architecture recalling the Gothic style of many church schools in England, but the villagers were drawn together in parent-teacher associations, at school committees, at picnics and prize-giving. The proliferation of other clubs is astonishing, and at time incredible when one considers the scope and aims of the club in relation to the area and its accessibility. The orchestral society at Makuri and the debating club at Norsewood (and the geographical society at Pahiatua) must have placed a severe strain on local resources. But the temperance clubs, the mechanic institutes, the self-improvement societies, the friendly society lodges, either fitted the aspirations and the philosophies of the time, or like the advancement societies and settlers' societies, satisfied the needs of self-interest. The libraries were popular and so far as one can learn, were intelligent and liberal in their acquisitions. More relaxing forms of social life were to be found at brass band concerts, christy minstrel visits; and drawing upon the outside world, shows given by ventriloquists, horse breakers and phrenologists. For the energetic, sports clubs provided for a range of interests. Coarser pleasures could be satisfied in the billiard saloons and in the public bars. Concerning other aspects of social life, silence is maintained, except for this: "The village settlers have got rid of a nuisance at last. A woman who has been living in the Short Road left yesterday morning by coach".

The social life of the village rested upon a fund of mutual assistance between neighbours and friends. The conditions of pioneering had made co-operation a necessity. One of the first acts of co-operation undertaken by the settlers of the Forty Mile Bush arose from an outbreak of a fever of a low typhoid type, which required that all club together to pay for the services of a doctor, and to accept on their own part a certain amount of hygienic discipline. The question of providing and securing medical services was often a cause of community action; and in times of distress, when bush fires caused extensive damage, relief funds would be opened in the village for the unfortunates. Much of the money for halls, church buildings, or equipment was raised by a variety of money-making concerts, dances and bazaars. Most illustrative of the neighbourliness of village life are the frequent references to farewell parties held for a departing family in the village hall; or welcome parties like the one for Mr and Mrs C. on their return from their honeymoon, when "Mr L—— in a felicitous speech, extended to Mrs C—— a cordial welcome to O——", and presented her with a pair of silver vases. This recalls to mind Carol Kennicot's introduction to her new life.

The economic prosperity of the period and the sound prospects for trade and advancement encouraged some villagers to establish for them-

selves town government, which had the power to levy rates and undertake improvements. Together with the Domain Board and the Cemetery Board, the Town Board provided scope for the public minded. But these ventures into local government were of "catchpenny consequence". Of the £288 15s. 2d. received by the Otane Town Board for the year ended 31st March 1897, £80 10s. was received in the form of subsidies, £60 3s. in general rates, £48 10s. in publican licences and dog fees, and the total included a balance of £82. £219 13s. 11d. was expended on maintenance and repair work. Thirty-three years later it is to be noted that of the £702 5s. expended, £135 went in salaries, £128 5s. went on running costs and insurance, £185 on streets and footpaths, and the rest went largely upon maintenance and repairs and street lighting. As one letter writer commented on the Town Board projected for Takapau: "The experience of similar townships to Takapau having a town board, is that after paying their debts, salaries and incidental expenses, they are left with a small sum of money totally inadequate to improve footpaths or anything else to any appreciable extent. Always boost from a concrete foundation. First of all boost for closer settlement. When you get this, Takapau or any other town will prosper and thrive without the cackle of a booster . . ."

Rapid Growth of Some Villages

It was during this period of stabilisation that a few of the villages displayed rates of growth markedly superior to that of the majority, so that they began to distinguish themselves from the village community and entered ultimately a higher rank of the urban hierarchy. It is quite material to the study of the evolution of the village community to inquire briefly into the cases of this differentiation; though it is true the full inquiry is more appropriate to the study of the evolution of the borough and provincial city communities. Of all the villages established after 1870 only two, Palmerston North and Dannevirke, were oustandingly successful settlements, in the sense that their growth matched the hopes of their founders. If one includes the early small farm settlements of the Wairarapa, established in the 1850s, then Masterton may be added to the list.[11]. In each of the three cases the settlement was favoured by its location. Masterton is a natural focus of routes from the north and from the east particularly. Palmerston North commands the important gap of the Manawatu Gorge. Dannevirke is situated very favourably to cope with the trade of the northern part of the Seventy Mile Bush; to the west lies quite densely settled dairy farming land, and from the east a number of route ways which penetrate the higher areas converge on the town. When one contrasts the sites of Dannevirke and Norsewood, founded at

[11] Feilding was from the beginning intended as the main town of the Manchester Block, and it has fulfilled that role.

the same time, the deficiency of Norsewood's site lies in its too great a proximity to the northern border of the bush; so that unlike Dannevirke, which was surrounded by the developing bush community, Norsewood's northern hinterland included the much less densely settled and socially different grazing area, which in effect it did not serve. Furthermore, Norsewood was not sited on the railway line and had the competition of nearby Ormondville.

The argument cannot however be left here, for the location of Bunnythorpe in relation to the Manawatu Gorge was equally as promising as that of Palmerston North, yet Bunnythorpe is still only a village. Furthermore, Pahiatua, which was some distance from the railway, which possessed no better site than Eketahuna or Mangatainoka (and they were both on the line), nevertheless grew to be the more important centre of the southern portion of the Seventy Mile Bush. Like Eketahuna, Pahiatua suffered initially from the competition of a large number of nearby village settlements, but this factor, which was used to explain Eketahuna's retarded growth, did not apparently operate in the case of Pahiatua. Thus to explain the prominence of one settlement a number of human and social factors must be taken into account. Site, location, and transport routes are of significance, but not of overwhelming importance.

In the case of both Dannevirke and Pahiatua doubts were expressed concerning the soundness of their early growth. In 1887 a correspondent thought ". . . they are inclined to overdo this place (Dannevirke) with shops, and I would not advise any more to start unless they had a little spare cash they were anxious to lose." In the same year cynics asked of Pahiatua if there was anything to sustain its growth. But apparently business men of both settlements were sufficient to the task. At Pahiatua they were described as "all bulls, i.e. one who operates on a rising market. He spreads reports about certain sections being sold for high prices, he attends auction sales and runs the prices up, he induces outsiders to bring capital in. All the while he invests all the money he can beg or borrow in the place". At Dannevirke the "rush and boom and bustle" was furthered still more by the efforts of a conscientious and hardworking body of city fathers; and apparently their descendants were still at work in the 1930s when it was suggested that the Dannevirke Agricultural and Pastoral Association, the Chamber of Commerce, the Farmers' Union, the Dannevirke Retail Association, might hold a conference to discuss ways and means of fostering shopping in the town. Our knowledge of the social and economic forces which created the boroughs and cities of New Zealand is most inadequate, but one can at least make the suggestion that the greater eminence of such settlements as Dannevirke, Pahiatua and Palmerston North was in a considerable part due to the character of their business community, and that probably in many of the villages which did not grow the settlers

Photo: S. H. Franklin

Fig. 10. Rongotea 1953. These disused stores symbolise the economic decline of the village since the 1920s. More recently they have been demolished.

Photo: S. H. Franklin

Fig. 11. Main Street, Rongotea 1960. In a period of increased mobility and rapid transit everything is rendered subordinate to the road itself.

themselves were inadequate to the competition for growth, owing to the absence of commercial experience or insufficient capital resources.

Services and Occupations

But if during this second phase of development such differences in rates of growth became apparent, nevertheless it was for the majority of the villages in the province the period during which they achieved their greatest importance. The occupational character of the villages in 1910 reveals certain similarities with the occupational structure of the village today. The storekeepers, hotelkeepers, teachers, post office officials, the railway and transport workers and dairy factory employees are still commonly found today. But the comparatively large group associated with the bush felling industry has disappeared; so has the majority of the blacksmiths, wheelwrights and saddlers. The large group of labourers represented in most villages in 1910 is now markedly reduced in size, whilst many occupations such as domestic, gardener, solicitor, hairdresser, bootmaker, tailor and photographer, draper and ironmonger have been lost to all villages. The occupations associated with the motor trade are the only principal ones which the village has gained since then. Not only were the villages during this second phase clearly more numerous but their economic structure was more diversified. To plot over a period of time the distribution of one occupation, that of registered medical practitioner, provides an interesting commentary on the economic fortune of the villages (Fig. 13). The question of obtaining medical services was one which soon touched all settlers. By 1895, approximately at the end of the first phase of settlement, only six villages possessed a resident doctor. By 1910 twice that number possessed them, which meant not only that the density of settlement was sufficiently great to warrant the establishment of a practice, but that the population was prosperous enough to pay for medical services. By 1925 the number of doctors was reduced to six again and by the middle fifties when the consequences of the motor car, the centralisation of services and the urbanisation of the population had been fully exposed, the number had fallen to four.

The villagers themselves were not unaware of the changes and the improvement in life which occurred during this second period. The appearance of such innovations as the telephone, kinematograph and the motor car were frequently noted and recorded. The landscape of the villages began to change as the trees which the original settlers had planted approached maturity. "There is a general and generous expansion of thought and action. The new generation feel that life is something more than mere animal existence. A lust for literature and music, and the drama has been steadily cultivated. The once exceptional piano

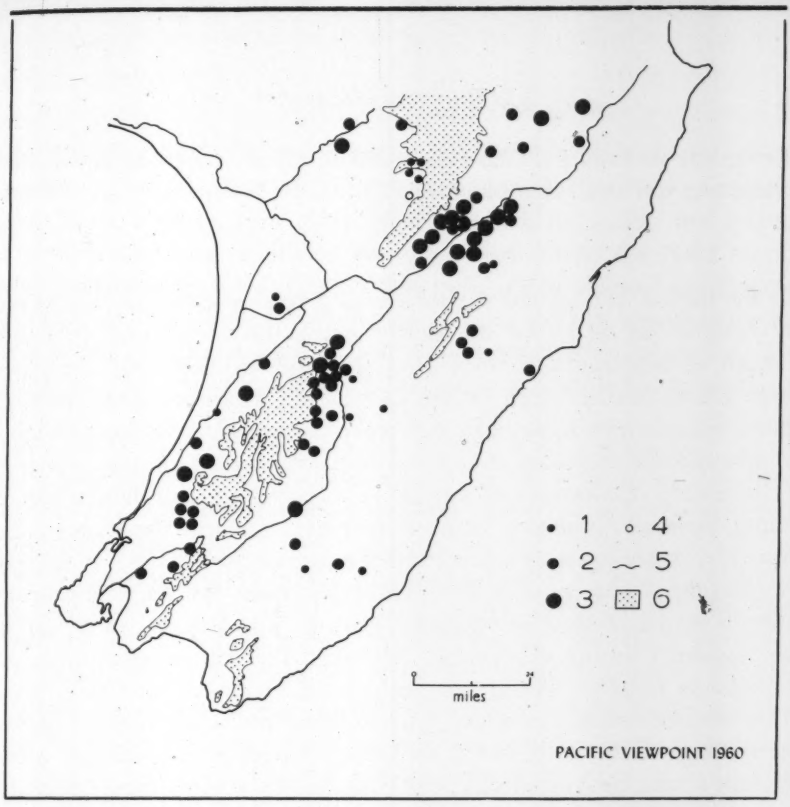

Fig. 12. Sawmills 1907.
Numbers of men employed: 1. 1-10 2. 11-20 3. 21-40 4. Not available
5. Railway lines 6. Land over 2,000 ft

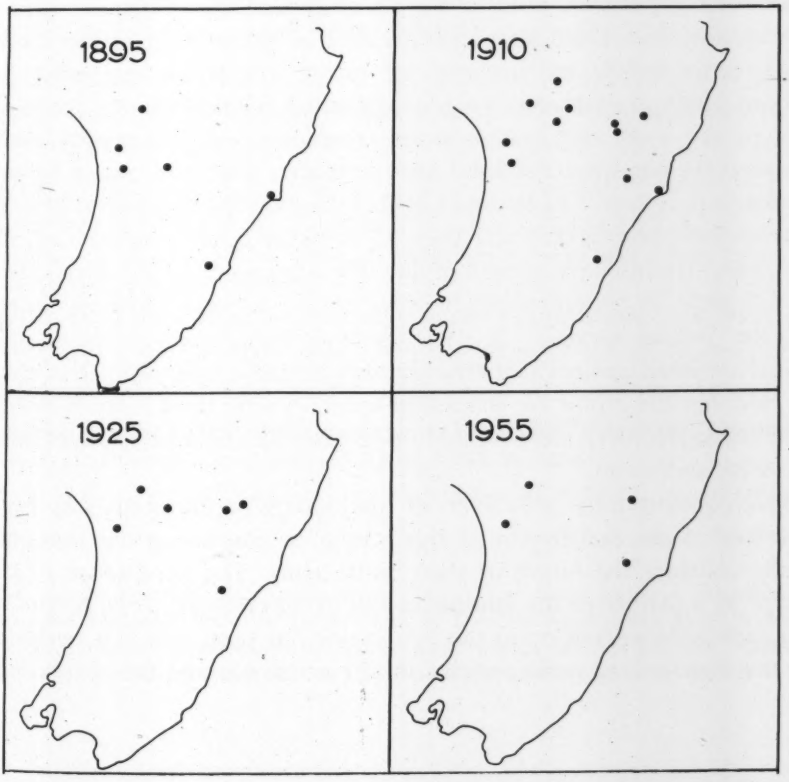

Fig. 13. Doctors Resident in Villages.

and organ is now part of the household furniture, even the up to date gramophone has been domesticated."

THE LATEST PHASE—RELATIVE DECLINE

In the period 1895-1920 the village as a type of community successfully catered for many of the needs which the social and economic structure of nineteenth century New Zealand implied. The structural change which has occurred in the Dominion's economy since then has implied needs which have been met more conveniently in the provincial city and the metropolitan area. The industrialisation of the economy, the increasing technological nature of society, the mechanisation of farming, have all entailed a swing in emphasis towards the larger urban community. Consequently since 1920 the role of the village has declined in importance. The most recent period has been for the village community a period of slow or negligible growth. The village can be said to have stagnated during this period. Although the village community has continued to function as part of the national economic structure, it has in this structure little autonomy. The explanation of the relative decline of the village is therefore but a subsidiary aspect of the account of the evolution of the provincial city, and thus lies except for these generalisations, outside the scope of this paper. Notice must be taken however of one of the most important means of this change, the motorisation of society. The advent of the motor car and truck put an end to the isolation of the rural population, reduced the importance of the village as a centre of transport and aided the centralisation of services. The car made people more mobile and the response to this innovation was rapid. As early as 1920 one settler in Onga Onga noted "Christmas and the New Year passed away very quietly as far as business was concerned. There was no talk about the hundreds and thousands that were taken by the shopkeepers of late. I have been talking to a good many grocers, drapers and butchers and bakers and they all say Christmas preparations are not worth five minute's consideration. The attractions of the big centres are too great. A big crowd left here for Napier to see what some people call the 'Maori Grass'." In 1925 another correspondent wrote this epitaph: "Small centres scattered throughout the countryside were then the rule, but the motor car has killed them. Among them were Woburn, Wimbledon, Herbertville, Wallingford, Wanstead, Patangata, Onga Onga, Tikokino and so on."

The contemporary character of the village community has been described in the earlier part of this article; in conclusion one can only briefly consider the future of these settlements. The persistence of the village as a feature of the landscape and as an element in the economic structure is dependent upon the two major functions which it performs for the surrounding rural population, the economic and the social. It is

unlikely that it will lose any more of its services, and the possibility of further decentralisation of industry may create a few more economic opportunities, especially in those villages which lie within the spheres of the provincial centres. In the regions influenced by the large metropolitan communities the dormitory function will in all probability grow in importance, but such developments tend to modify significantly the nature of the villages so that they become suburban in character. The high standard of living obtained by the farming community permits the development of a full social and community life which is conducted within a highly formalised framework, so that clubs, associations, organisations proliferate in the village, which serves as a focus for these activities. This will undoubtedly contribute much towards the preservation of the village.

The village community played an important part in making over the accessible parts of the North Island's inland forest areas. This task successfully accomplished, society took a different tack which led it into the increasingly technological world of the twentieth century, wherein the village appears as a vestigial form derived from an earlier cultural milieu. Its future remains largely dependent upon the functions which it is required to perform for the farming community, to whose development it has contributed so much.

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The quotations used have been drawn from four main sources: documents held in the National Archives, Department of Internal Affairs; the Records Section, Head Office, Department of Lands and Survey, Wellington; the Appendices to the Journals of the House of Representatives of New Zealand (A.J.H.R.),

Government Printer, Wellington; newspapers, principally *The Hawke's Bay Weekly Courier, Hawke's Bay Herald, Woodville Examiner, Rangitikei Advocate, Wairarapa Mercury* and *Wairarapa Standard.*

The Appendices to the Journals have also been the source for most of the maps.

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The Nature and Distribution of the Natural Vegetation of Malaya

OOI JIN-BEE

ABOUT three-quarters of the land area of Malaya is still covered with dense evergreen forest, the characteristic vegetation of the hot, wet tropics. This forest, which is usually referred to as tropical rain forest, has developed as a result of the uniformly high temperature and heavy, evenly distributed rainfall of the peninsula; it is the climax vegetation of the equatorial climate. Within this general term, the rain forest shows different aspects and floristic composition according to locality. It is modified locally by the nature of the soil, whether lateritic or sandy, dry and well-drained, or swampy and liable to flooding. For example, the forest which is established on the steep limestone hills of Perlis and the Kinta Valley is different in composition from the ordinary lowland forest in that the plant species are those which can adapt themselves to a calcareous soil as well as dry conditions. The mangrove swamp forests and the peat swamp forests are two special edaphic types of forest which occupy large areas in the peninsula. The tropical rain forest is also modified locally by altitude; with increasing altitude the lowland rain forest gives way to submontane and montane rain forest, a result of temperature changes rather than of rainfall. In the peninsula the altitude of 2,500 feet is roughly the transitional zone between lowland rain forest and submontane forest, and the altitude of 4,000 feet that between submontane and montane forest. Both these altitudes are approximations only, for the transition between one forest type and another is always gradual and nearly imperceptible. At the same time, it must be realised that, apart from temperature, other climatic factors such as rainfall, humidity, wind velocity and sunshine also vary with altitude, but not uniformly and consistently as in the case of temperature. Because of this fact, the actual altitudinal limits of the vegetation zones are different on different mountain ranges in the Malay Peninsula, and may vary even on different parts of the same mountain. The zones also tend to be lower on small isolated hills and mountains than on continuous ranges. Thus for example, the *Dipterocarpaceae,* the dominant family in the lowland tropical rain forests, reach the upper limit of growth at about 4,000 feet in the main mountain ranges, and this altitude is taken as the approximate dividing line between lowland rain

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forest and mountain forest. But the upper limit of the *Dipterocarpaceae* on the isolated mountains is much less than 4,000 feet; it is, for example, only 2,750 on Gunong Belumut in Johore.

Figure 1 shows the distribution of the main types of vegetation in the Malay Peninsula. Lowland tropical rain forest covers the largest area; the other vegetation types are limited in their distribution by one or more factors—either altitude, as in the case of mountain forests, or soils and location, as in the case of mangrove, beach and freshwater swamp forests.

MANGROVE SWAMP FOREST

Mangroves are species of evergreen trees inhabiting tidal land in the tropics. Mangrove forests occupy some 560 square miles in the Malay Peninsula. More than 95 per cent of these forests are distributed along the West Coast, where they form an almost continuous belt stretching from Perlis to Singapore. The belt varies in width from a few yards to 12 miles. The continuity of the belt is broken by numerous tidal creeks which cut off islands of different sizes. Exposure to wave action and other adverse environmental conditions limit the extent of mangroves in the east coast; they are here confined to river mouths and occupy areas seldom exceeding two to three square miles. The mangrove forests of the peninsula are exceptionally luxuriant and consist of at least 17 "principal" species and 23 "subsidiary" species. Associated with these are the nipah palm (*Nipa fruticans*), the nibong palm (*Oncosperma tigillarium*), and various weeds and ferns.

Mangrove trees are adapted to maritime conditions and cannot survive in fresh water or on land. The seedlings are unable to withstand strong waves and surf, and for this reason mangrove forests can only develop in sheltered locations as found along the west coast of the peninsula. Extensive mud banks are built up in such quiet localities through deposition and silting, and these form favourable sites for mangrove development. Muddy beaches are the rule on the west coast but the exception on the east. The soil requirements vary with the different species of mangrove but the best soil is deep, well aerated mud, rich in humus but with little or no sand. The larger part of the mangrove swamps of the west coast is covered with such soil.

There is a definite relationship between the distribution of the major species of mangroves and the frequency of tidal inundation of the land they colonise. Table 1 below summarises this relationship as worked out for mangroves growing in the neighbourhood of Port Swettenham.

The main types of mangrove communities are:

The AVICENNIA-SONNERATIA GRIFFITHII *type*

The first stage in the formation of a mangrove swamp is the colonisation of mud banks or sand banks which are exposed at neap tides. The

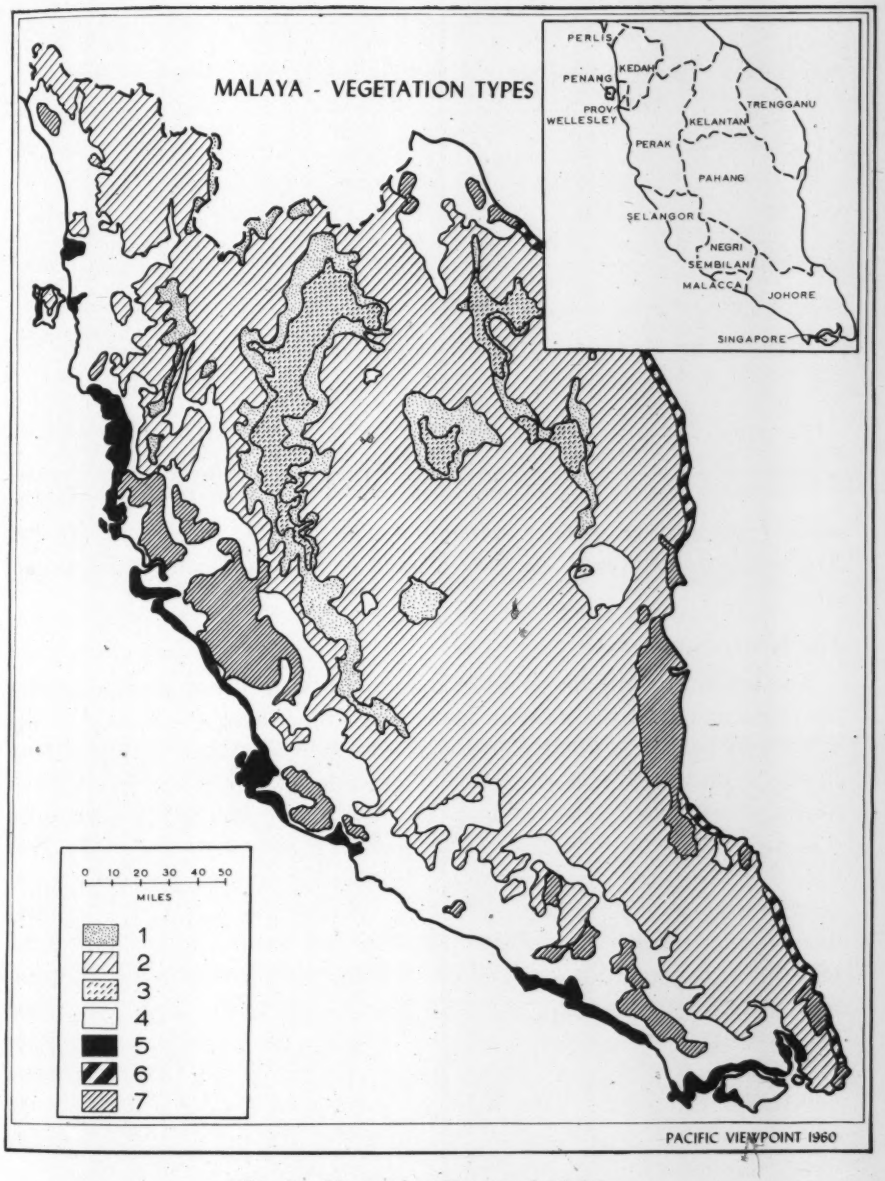

Fig. 1. Vegetation Types of Malaya.
1. Submontane Forest 2. Lowland Rain Forest 3. Montane Forest 4. Unforested Area 5. Mangrove Forest 6. Beach Forest 7. Freshwater Swamp Forest

TABLE 1

Frequency of Tidal Inundation and Distribution of Main Mangrove Species

LAND FLOODED BY	NUMBER OF TIMES FLOODED PER MONTH	MAIN MANGROVE SPECIES
All high tides	56-62	None
Medium high tides	45-59	*Avicennia* and *Sonneratia griffithii*
Normal high tides	20-45	Most species, but *Rhizophora* predominates
Spring high tides	2-20	*Bruguiera*
Abnormal or equinoctial tides	0-2	*Bruguiera gymnorhiza*

pioneer species are usually *Avicennia alba* and *A. intermedia.* In the river estuaries, however, the new ground is first colonised by *Sonneratia alba.*

The RHIZOPHORA *type*

The second or middle phase of mangrove swamp formation is usually the replacement of the pioneer species by *Rhizophora* as the level of the mud bank is built up and the pioneer fringe extends seaward. The land is now inundated by normal high tides but with dry periods of from four to eight days twice each month at neap tides. Other conditions which are necessary for the establishment of *Rhizophora* are soils that have been aerated and enriched by the pioneer species, and which contain little or no sand. The main species of *Rhizophora* are *R. conjugata* and *R. mucronata. Rhizophora* forests cover two-thirds or more of the total area of mangrove swamps on the Malay Peninsula, and they provide the bulk of the mangrove products (e.g. firewood, timber, charcoal and tanbark) which are extracted annually. The Malay name for *Rhizophora* is *bakau.* In Perak where the mangrove forests are best developed, the annual yield per acre is about 3,000 cubic feet, but the yield from the average mangrove forest in the Malay Peninsula is usually much less than this.

The BRUGUIERA *type*

There are many species of *Bruguiera. B. caryophylloides* forms thick pure stands where the soil is a stiff clay and flooded only by the spring tides. It is confined to the sea-face of the mangrove belt and is usually absent in the river estuaries. *B. gymnorhiza* occupies the driest section of the tidal land—subject to inundation only during the spring and the equinoctial tides. It marks the final stage in the development of the mangrove forests and the beginning of the transition to the inland low-

Photo: R. Wikkramatileke

Fig. 2. South bank of the Pahang River mouth showing beach forest on seaward face with a fringe of casuarina trees along the shore, and dense mangrove forest on the inner curve of the river mouth.

Photo: H. B. Gilliland

Fig. 3. Canopy of tropical rainforest as seen from Kedah Peak. Variety in species composition and unevenness in height are evident.

land rain forest. The soil has a noticeable sand content, and on the landward side the ground level may be raised above the level of even the highest tides through the deposition of sediments and dead organic matter and the activities of burrowing prawns. *B. gymnorhiza* grows to a great size if left undisturbed; individual stands may have trees up to 120 feet high and eight feet in girth. The Malay name for this species is *tumu merah*.

The mangrove swamps on the west coast of the peninsula are continually extending seawards into the Straits of Malacca, and as this process continues, the seaward face is gradually colonised by the pioneer species of mangroves, while the landward side of the swamps is converted into dry land as the ground level is raised and the mangroves give way to inland rain forest. The process is a very slow one, and may be interrupted by uncontrolled felling of the forests.

Along the brackish water zone of estuaries mangroves give way to brackish water palms—nipah (*Nipa fruticans*) and nibong (*Oncosperma*). Nipah is used extensively for thatching, and nibong poles, which can withstand prolonged submersion in sea water, are employed in the construction of fishing stakes.

BEACH FORESTS OF THE EAST COAST

The mud banks and mangrove forests which characteristically line the west coast of the Malay Peninsula are absent along the east coast, except in the sheltered river mouths. Instead sandy beaches dominate the coastal landscape from Johore to Kelantan, their continuity broken only by the mouths of the rivers which debouch into the South China Sea. At intervals along the coast and extending for some distance inland from the shoreline are the old, raised beaches known locally as *permatang*. These are usually arranged in a series parallel to the line of the coast, the channels between successive ridges enclosing lagoons in various stages of reclamation by swamp vegetation. In other places the sandy beaches give way inland to sand flats or sandy plains. Beach forests develop on these sandy beaches and flats and, like the mangrove forests, owe their presence and character to special soil and water conditions.

The typical vegetations of the sandy foreshores are low growing herbaceous plants, which occupy a narrow zone immediately above tide level. Many of the plants have a trailing habit, sending long runners over the surface of the sand. The most common of these are the creeper *Ipomoea pes-caprae* and the creeping grass *Ischaemum muticum*. The majority of the species which colonise this zone are capable of withstanding occasional submergence in sea water and are unharmed by the high salt content of the soil. The screw-pine, *Pandanus fascicularis* (Malay: *mengkuang*), with its pineapple-like fruit, may occur scattered

or in groups. But the most striking and distinctive species in this foreshore zone is the casuarina tree, *Casuarina equisetifolia* (Malay: *ru* or *aru*). Its area of natural distribution is along the east coast of the peninsula; elsewhere, the casuarina is planted. It is a quick growing pioneer of the sandy shores, capable of attaining a height of 100 feet in 25 years. The seedlings are unable to survive in thick forest or dense shade or even in the carpet of fallen needles under the mature casuarina trees. For this reason the casuarinas can only regenerate themselves naturally if the shore is continually building itself seawards and providing the seedlings with a succession of open sandy beaches in which to establish themselves. At Telok Subong on the East Coast of Johore and in several places along the Pahang coast the stands of casuarina attain a width of several hundred yards, but the normal pattern is a very narrow strip or even a single line of such trees along the sea front (Fig. 2). Many of the casuarina stands along the east coast of Malaya have been cut down for firewood or in places to make way for coconut holdings.

Inland from the fringe of casuarina and the narrow zone of low growing herbaceous plants, shrubs and trees become increasingly common. The trees may form a dense belt of woodland or may be scattered in groups with open spaces between. The sandy ridges of the *permatang* support forest of a xerophytic type. The soils here are almost pure sand below the top few inches, and some of the profiles may contain a lateritic iron pan close to the surface. In such locations the characteristic trees are various species of *Eugenia,* particularly *E. grandis* (Malay: *jambu laut* or *jambu jembar*) and small trees such as *Garcinia hombroniana* (Malay:*beruas*), *Vaccinium malaccense* (Malay: *setumbar*), and *Glochidion* (Malay: *membatu*). In parts of the south Pahang and the Kuantan coasts the sandy ridges carry almost pure stands of *Hopea mutans* (Malay: *giam*) and *Shorea materialis* (Malay: *balau pasir*).

The channels and low-lying ground between the *permatang* are usually swampy and support trees adapted to growing in waterlogged soils. In swamps that are not more than a few feet deep, the typical tree is *Melaleuca leucadendron* (Malay: *gelam*). It is very abundant in the stretch of low ground between Kuala Trengganu and Besut. The timber is used by the Malays for firewood and the papery bark for caulking their boats. The deep swamps which contain thick layers of peat carry forests which are similar to the inland peat swamp forests of other parts of the peninsula.

FRESHWATER SWAMP FOREST

Freshwater swamps develop in locations characterised by an abundance of water on or near the surface of the ground. They occupy an estimated ten per cent of the total area of the Malay Peninsula. Much of the 850,000 acres of padi land in Malaya today was once freshwater

swamp. The swamps vary considerably in character and in the level of standing water. There are all gradations from *lopak,* which is a special type of swamp subject to only occasional inundation, to the deep swamps covered with water all the year round. The freshwater swamps occupy the zone between the mangrove swamps and the dry land of the foothills of the interior mountain ranges; they are found along the entire stretch of western Malay, but are restricted to the southern half of the peninsula in the east from Kuantan to the southernmost tip of Johore. North of Kuantan the Trengganu Plateau comes close to the coast with no intervening stretch of swampy flat land between foothill and coast. Most of the freshwater swamps of the Kelantan delta have been cleared for cultivation, and only patches of such swamps remain in this part of the peninsula.

The soils of the freshwater swamps are formed under conditions of restricted drainage. The swamp soils are of two types: soils which develop under oligotrophic (extremely mineral deficient) conditions and which contain a surface layer of peat; and soils which develop where the water supply is eutrophic (rich in bases) and which contain little or no organic matter or humus. The plants that grow in swamps are specialized and adapted to conditions in which the soil is waterlogged. For this reason in many of the swamp forests the number of tree species is restricted. There is also a tendency for one or a small number of species to be dominant; for example *Melaleuca leucadendron* (Malay: *gelam*) is dominant in many of the swamps of Kedah and Perlis, and forms pure stands over large areas. The level of water is also important in determining the type of vegetation in the swamps. Swamps with very great permanent depth of water have few or no tree species. The floristic composition of swamps gradually changes from the edge of the swamp where there is little or no peat towards the centre where the peat layer may be up to thirty feet thick.

The vegetation of the peaty swamps includes species of *Pandanus* and palms as well as representatives of the chief families normally present in the rain forest. The undergrowth is thin where the trees are large and close-grown, but dense and thick where the trees are widely spaced. In general, however, the undergrowth is thicker than that in inland rain forest.

The swamp forests may contain commercial timber trees such as *Campnosperma* (Malay: *terentang*) and *Cratoxylon arborescens* (Malay: *geronggang*). A careful enumeration of 6,000 acres of swamp forest in Sungei Bernam showed that there was an average of 13 trees per acre which were of commercial size; of these the most important was *Shorea nugosa* (Malay: *meranti bakau*). Other trees of commercial importance are *Koompassia malaccensis* (Malay: *kempas*), *Fragaea crenutata* (Malay: *malabera*), and *Tetramerista glabra* (Malay: *punah*). The latter is sometimes the most abundant tree in freshwater swamp,

usually growing in the shallower parts where the soil is very soft and peaty. The exploitation of timber from freshwater swamps is always difficult because of inaccessibility, but in recent years has become a practicable proposition through the use of light diesel locomotives running on tramways laid over the swampy ground from the nearest road or river. Costs, however, remain higher than in the case of timber extraction from dryland forest, and labourers as a rule dislike the living conditions in the swampy environment. In spite of these disadvantages the swamp forests of Malaya are assuming a greater importance yearly as a source of timber and forest products.

LOWLAND RAIN FOREST

Tropical rain forest covers all parts of the Malay Peninsula from sea level to about 2,500 feet elevation, except for the littoral (mangrove and beach) forests and freshwater swamp forests described above. About 30,000 square miles or 60 per cent of the total area of the peninsula are still occupied by lowland rain forest. The area under such forest was considerably larger less than a century ago, but the large-scale clearing of forested land for mining and agriculture, particularly in Western Malaya, has reduced the total to the present figure.

The most important characteristic of the lowland rain forest of the Malay Peninsula is the remarkable wealth of species. There are no less than 8,000 species of flowering plants, and at least 2,500 of these are trees. A typical acre of forest has about 200 trees of about 100 different species, besides a great number of shrubs, herbs, lianes and epiphytes. In fact, the floristic composition of the lowland rain forest of the Malay Peninsula is probably the richest in the world. The other outstanding feature of the rain forest is that the large majority of the plants are woody and attain the size and dimensions of trees. Not only do trees predominate in the forest, but the undergrowth consists mainly of woody plants, and most of the climbing plants as well as a few of the epiphytes are also woody. The continuous growing season in the peninsula favours the growth of woody plants as against herbaceous and other smaller plants, while the very long period over which the flora of Malaya has been evolving probably explains the extraordinary number of different species of forest trees in this part of of the tropics.

Although the lowland rain forest consists of an extremely rich flora, the different species of plants are distributed in the greatest disorder and only occasionally are one or two species dominant within the forest community. The different species vary in the space they occupy, some being restricted to localised sectors of the forest and others distributed over very large expanses. This lack of order in distribution of species and the general heterogeneity of the rain forest stand in contrast to the uniform external appearance of the forest, especially when viewed from

the air. The rain forest is evergreen, and its general appearance remains the same throughout the year. A few trees may lose their leaves at different times of the year, but these are too scattered and insignificant in number to have any effect on the monotonous green of the forest canopy.

The rain forest trees of the Malay Peninsula as a whole have several physiognomic features in common, a result of the adaptation of different species to similar ecological conditions. The tree trunks are usually tall and straight, and are branchless except near the top; the crowns of these trees interlock with each other to form a continuous canopy. Many of the trees have buttresses at the base to provide additional support as their roots do not penetrate far into the soil. Other trees support themselves by the aid of adventitious roots which originate at the lower part of the trunk; these roots hold up the trees much in the same way as wires hold up a telegraph pole. The bark is usually smooth and thin, commonly light grey in colour but sometimes reddish brown. The leaves are generally large, leathery and dark green in colour. The flowers are small and inconspicuously coloured; large and colourful flowers are rare.

The undergrowth of the Malayan rain forest consists of shrubs, small palms, herbaceous plants, gingers of varying sizes, ferns, and large numbers of sapling and seedling trees. Contrary to popular belief, the undergrowth in mature rain forest is not impenetrable. It is only on river banks or in forest clearings where sunlight reaches the ground that the undergrowth becomes dense enough to make progress extremely difficult if not impossible. The ground of the forest is not everywhere covered with a thick carpet of dead vegetation, but is often quite bare beneath a thin layer of fallen leaves and branches. The herbaceous ground plants are sparse and grow best on slopes where the light is slightly stronger.

Apart from trees, shrubs and ground herbs, all of which are strong enough to support themselves, the rain forest includes also two types of plants which are dependent on others for support, namely, the climbers which grow from the soil but support themselves on trees up to the upper level of the forest where there is better light; and secondly the epiphytes which do not grow from the soil but perch themselves on the branches and trunks of the trees. Most of the climbers are woody (lianes) and grow to very great lengths, hanging down from the forest canopy in great loops and festoons. They belong to a great many families, and there is a good proportion of economic plants among the lianes, of which the rattans are perhaps the best known. A rattan cane may grow to a length of two hundred feet or more. There are more than a hundred species of rattans in the Malay Peninsula, the majority of them belonging to the genus *Calamus*.

The epiphytes are a very abundant plant community in the rain forest. They include large numbers of orchids and other flowering

Photo: R. Wikkramatileke

Fig. 4. Swamp forest about 15 miles inland from the mouth of the Rompin River. Nipah palms (*Nipa fruiticans*) are prominent along the banks of the river.

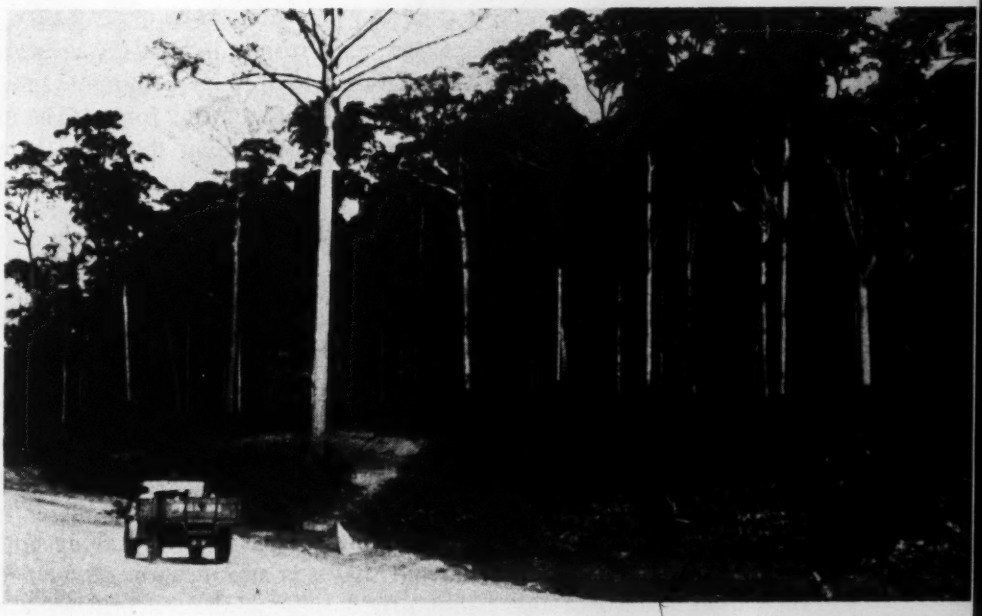

Photo: H. B. Gilliland

Fig. 5. Profile of lowland tropical rainforest, Temerloh-Maran road.

plants and many ferns. They are adapted to an arboreal existence where the most pressing problem is water supply. Many epiphytes have fleshy leaves, or leaves which minimise water loss from transpiration. Orchids have pseudo-bulbs which act as reservoirs for water; other epiphytes have long aerial roots which absorb water from the atmosphere.

It is apparent that the lowland rain forest is extremely complex in character and is composed of numerous plant types, mostly woody in structure. The forest as a whole is arranged in several storeys or strata, a storey or stratum being a layer of trees whose crowns are more or less of the same average height. In the Malay Peninsula, as in other tropical regions of the world, the primary rain forest communitites are arranged in three main tree storeys. In addition, there are also two layers of undergrowth, so that there are five storeys in all between the forest floor and the crowns of the highest trees. The topmost storey is made up of very large trees most of which are valuable as timber trees; the most important of them are species of *Dipterocarpus* (Malay: *keruing*), *Dryobalanops aromatica* (Malay: *kapur*), *Shorea* (Malay: *meranti*), *Dyera costulate* (Malay: *jelutong*), and occasionally some other species. Most of the species in this storey are light-demanders. Their crowns do not start until 80 or 100 feet above ground and may rise to 130-180 feet. Very occasionally some trees may reach heights of over 200 feet; the tallest tree recorded in Malaya measured 265 feet. It is common to discover three or more top storey trees growing together and separated from the neighbouring groups by fairly pronounced gaps.

The second storey is, in fact, the main storey, in that the crowns of the trees here interlock with each other to form a continuous closed canopy, sometimes referred to as the "roof" of the forest. The tree crowns are usually smaller and more compact than those of the top storey trees, and they begin from fifty feet above ground level, rising to 80 or 100 feet.

The third story is composed of trees which do not reach above 50 or 60 feet in height. This storey is composed of a very large number of species, especially members of the families *Annonaceae, Euphorbiaceae,* and *Flacourtiaceae*. However, few of the species here are of economic importance.

Beneath these three main tree strata is firstly, a layer composed of shrubs, palms, and herbaceous plants, and under this is the last and fifth layer comprising the ground flora of ferns, herbs, low-growing palms such as the bertam palm (*Eugeissonia tristis*) and the pinang palm (*Pinanga spp.*), and also seedlings of the species making up the tree strata. It must be remembered that this stratification of the forest vegetation into five storeys is not a rigid one, and the spaces between the storeys may be occupied by species growing gradually from a lower stratum to a higher one.

The lowland rain forest of Malaya contains more than 350 species of trees which yield timber, excluding the timber trees of the seashores, freshwater swamps and mountains. The most important species from the commercial point of view are those of the family *Dipterocarpaceae*; these collectively provide three-quarters or more of the timber output of Malaya. Most of the species of this family require a hot, wet climate for optimum growth, and a few of them are found in the peninsula north of the 7° North latitude. They are distributed throughout the peninsula from sea level to more than 4,000 feet altitude. They grow in a variety of situations, on poorly drained land as well as steep slopes, but seem to attain their best development in undulating or hilly country. The trees are large and generally belong to the first two storeys of the rain forest. A characteristic feature is the presence of wings on the fruit of most species, a mechanism that aids the dispersal of the seeds. The principal species of the family are the heavy hardwoods, *Balanocarpus heimii* (Malay: *chengal*), *Shorea* (*meranti*), *Hopea* (*giam*), *Eushora* (*balua*), and *Vatica* (*resak*); the medium hardwoods, *Dipterocarpus* (*keruing*) and *Dryobalanops* (*kapur* and *keladan*); and the light hardwoods *Shorea* (red, white and yellow *meranti*), most species of *Hopea* (*merawan*) and *Anisoptera* (*mersawa*). Many of the species are gregarious to some extent; *Dryobalanops aromatica* (*kapur*) for instance, is abundant in forests near the east coast. The most abundant of the groups is the *meranti,* and they constitute about 17 per cent of the number of trees of commercial size in Malaya. There are usually between three to five trees of commercial size per acre. The next most abundant group is *keruing,* usually making up about nine per cent of the total number of trees of commercial size, with about two trees of such size per acre of forest. The heavy hardwoods are more restricted in distribution; patches of forest of 20 to 100 acres in extent in the east coast may have two or three trees of commercial size in them.

Apart from the *Dipterocarpaceae,* four other main species also produce valuable timber—*Intsia palembanica* (*merbau*), *Koompassia malaccensis* (*kempas*), *Dyera costulata* (*jelutong*), and *Tarrietia* (*mengkulang*). In addition, there are many other species which yield timber, some of which are used for special purposes such at boat-building, tool handles and fence posts. Among these are species of the families *Lauraceae, Sapotaceae, Burseraceae,* and *Myristicaceae,* as well as species of *Eugenia, Calophyllum, Dillenia,* and *Durio.*

SUBMONTANE RAIN FOREST

This is sometimes known as *Hill Dipterocarp Forest.* The transition between lowland rain forest and submontane forest occurs roughly between 2,000 and 2,500 feet above sea level. The forests lying above the 2,000 foot contour line cover roughly one-tenth of the total land

Photo: H. B. Gilliland

Fig. 6. Dwarf sub-montane forest on peat, Kedah Peak (3,992 ft).

area of the peninsula. They are of little value as sources of timber, but are of considerable importance as water catchment areas and as a protective cover, minimising soil erosion on the steep slopes of the uplands. Submontane forest occupies the area lying between the 2,000-2,500 and the 4,000 feet contours. The forest at the lower levels does not differ markedly in appearance from lowland rain forest. The difference is rather in the floristic composition—the lowland dipterocarp species being replaced by highland species such as *Shorea platyclados* and *S. ovata* and certain species of *Dipterocarpus*. One of the few indigenous conifers in the peninsula and also one of the largest hill forest trees is *Agathis alba* (Malay: *damar minyak*). The undergrowth is generally denser than in the lowland rain forest, and the ground is often carpeted with a thick layer of plant remains. Towards the higher levels of the forest the trees decrease markedly in height, and around 4,000 feet most species of dipterocarps disappear, and the floristic composition of the forest undergoes an almost complete change from lowland and hill species to mountain species.

MONTANE FOREST

Apart from floristic composition, mountain forests also differ from hill and lowland rain forests in external appearance, the trees being not as tall as the dipterocarps. Such forests occur above the 4,000 feet contour

and extend to the peaks of the highest mountains of the peninsula. The tallest trees are usually oaks, particularly species of *Pasania* and *Castanopsis*. Members of the *Laurel* family are also abundant, and in fact the term *Oak-Laurel* forest is sometimes given to the vegetation of the mountains.

A characteristic feature of the mountain landscape is the prevalence of clouds and mist. The perpetually moist atmosphere provides ideal conditions for epiphytes, and mountain forest is especially rich in such plants. The undergrowth is dense as the lower canopy allows for better light penetration to the ground, and the forest floor is generally covered with a profusion of small trees, climbing plants such as rattan palms, species of tree ferns belonging to the family *Cyatheaceae,* pitcher plants, ferns and orchids. The ridges and summits of the high mountains have only a thin soil impoverished by constant washing-out, and on these locations the forest is stunted and may be covered with mosses. The upper part of Kedah Peak, for example, has such a dwarf forest in which the moss *Sphagnum* is prominent.

SECONDARY FOREST OR BELUKAR

The area covered by primary (or climax) rain forest is continually decreasing in the Federation of Malaya, and has been reduced to practically nothing in the island of Singapore. Its retreat can be traced a very long way back when the first cultivators reached the Malay Peninsula and started to clear the forest in small patches in order to grow their crops. The process was accelerated as the population of cultivators (including the Malays, who practised permanent or sedentary agriculture based on wet padi, and the aborigines and occasional Malay who practised shifting or *ladang* cultivation) increased with later migrations as well as natural growth. But the greatest encroachment was made during the last hundred years when large areas of forested land were cleared for mining and especially for cash-crop cultivation. At the same time other forested land was cleared in order to grow some of the food crops needed to support the large number of immigrants who poured into the country from China and India. It is inevitable that further encroachments will be made on the remaining areas of forested land for either mining or agriculture as the need arises and the population increases.

But all the land that was cleared of its primary forest is not under agriculture or some other form of productive land use; a part of it, covering some thousands of square miles, is abandoned land under stands of grasses or other secondary growth and in the process of reverting to climax rain forest. These secondary plant communities are known throughout Malaya as *belukar* or sometimes as *utan muda* (young forest). Unlike the other types of natural vegetation, already described,

the distribution of *belukar* is not determined by soil, climate, or other natural agencies, but by man, who in deciding to choose a particular piece of land, clears it of its forest growth, and later abandons it, determining by his actions the location of that area of secondary forest. For this reason, the distribution of *belukar* does not follow a definite natural pattern as in the case of the other vegetation types.

Man's Role in the Creation of Secondary Forest

The area under secondary growth of one type or another is larger than is generally realised. Perhaps the most important cause of the destruction of primary rain forest which gives rise to *belukar* is the system of shifting cultivation which is practised by the aboriginal tribes (the Sakai or Senoi and the Jakun or Proto-Malay) and also by a few Malays living in the more remote and inaccessible areas of the peninsula. The system depends on the felling of a patch of forest, the burning of the fallen trees, and the cultivation of a few food crops on the patch so cleared. After one or more crops have been harvested, the plot is abandoned and a new one started elsewhere. The old plot meanwhile is colonised by secondary plant communities. The extent of abandoned land once under shifting cultivation (*ladang*) and now under various stages of regeneration to climax rain forest is much wider than previously estimated. That this should be so is due to earlier underestimates of the aboriginal population and to the tendency of the aborigines to avoid recultivating an abandoned plot. Thus, the number of aborigines in the Malay Peninsula is now known to be around 100,000 or three times the number estimated in the 1947 census. Assuming that each family of four cultivates a two acre *ladang,* the total area under shifting cultivation in any one year would be approximately 50,000 acres. Further, these groups seldom recultivate an old holding which has reverted to secondary forest, but prefer to clear a new patch of forest because it would yield better crops and would suffer less from the depredations of pests. Since it takes up to several hundreds of years for an abandoned clearing to re-establish itself as climax rain forest, it is unlikely that the area of fully regenerated forest is keeping pace with the area being cut down or newly abandoned, more so in view of the very long history of *ladang* cultivation in the peninsula.

Apart from *ladangs,* there are also large areas of land once under some form of agriculture or mining and now abandoned because of loss of soil fertility or of mineral exhaustion. In the western Tin Belt, and particularly in the Kinta Valley, the Larut tin fields of Taiping, and the Selangor tin fields, the mined-over land covers some thousands of acres. Still larger areas have been devastated as a result of indiscriminate agricultural practices in the past. Thousands of square miles of protected Forest Reserves were cut down for short-term food crops

during the Japanese occupation and subsequently abandoned. In Penang, Malacca and Johore the "soil-mining" methods of agriculture used by the early pioneers in growing such crops as pepper, gambier, tapioca, and pineapples have left their mark on the landscape in the shape of rolling acres of *lalang*—the ubiquitous and obnoxious weed *Imperata cylindrica*. The area of seriously degraded land in Malaya has been estimated to cover 2,000-4,000 square miles (or four to eight per cent of the total land area of the Federation); this estimate does not include the less seriously degraded land. All such land is either under *lalang* or *belukar* in different stages of regeneration to primary rain forest.

The *belukar* which appears on a site which has been abandoned varies according to the previous history of the site. Where the forest has been completely cleared and the area cultivated for three or more years, abandonment soon leads to an invasion by *lalang* grass. *Lalang* burns easily but because of its underground rhizomes it recovers quickly from a fire which may totally kill off other plants. Repeated firing results in the area being dominated by *lalang*, seriously delaying regeneration by forest species. If left undisturbed, however, the *lalang* patch will in the course of time be invaded by pioneer plant species such as *Melastoma malabathricum* and *Eupatorium odoratum*. Later woody species such as *Macaranga, Mallotus, Glochidion* and *Bridelia* take possession of the area; they form a close canopy up to 30 feet high. Under the shelter of their shade seedlings of forest trees take root and gradually the original type of rain forest is re-established. The transformation from *belukar* to primary rain forest may take up to 250 years or more.

Where the period of cultivation before abandonment is less than two years and the soil is less seriously degraded, a dense secondary forest is quickly established. The dormant seeds and coppice shoots of jungle trees as well as the pioneer species of plants rapidly invade the site and compete with each other for living space. The secondary species which are light-demanding and short-lived in any case, eventually succumb to the shade of the jungle species.

The character of *belukar* varies not only with the degree of felling and the period of cultivation or other forms of land use but also with the physical nature of the soil and the state of natural succession it is in. *Belukar* is a portmanteau term which covers all stages of natural succession from light scrub to high forest difficult to distinguish from primary rain forest. "Typical" *belukar* consists of a large number of herbs, herbaceous creepers and climbers and light-demanding shrubs and tree species which are not characteristic of primary rain forest. They grow in haphazard profusion but a few species are often gregarious in a patch-like manner. The thick undergrowth is very difficult to penetrate. The general appearance and floristic composition of *belukar* are also different from that of primary rain forest; the trees are smaller in size and the

canopy lower, though when viewed from above it has a more level surface than primary forest.

THE ROLE OF FORESTS IN THE MALAYAN ECONOMY

Of the 36,590 square miles of forested land in Malaya, 12,710 square miles are forest reserves under the control of the Forest Department (Fig. 7). About one-third of these reserves are forests over 1,000 feet in elevation, and are maintained for the purpose of protecting the headwaters and catchment areas of the rivers and streams from erosion and ensuring that the water in them is free from silt. These are therefore unproductive forest reserves. The other two-thirds of the reserves are composed of productive forests which are managed by the Forest Department for the purpose of producing a continuous supply of timber to meet the requirements of the country. Such forests may be likened to estates and plantations, except that here the crop is timber and not rubber or coconuts. It is estimated that the productive forests of Malaya yield between 200 and 500 cubic feet of timber per acre, though the yield may sometimes be considerably more. The yields of timber per acre are very poor compared with the 5,000 cubic feet per acre in the coniferous forests of Northern Europe and the 15,000 cubic feet in the forests of the Pacific seaboard of North America. This disparity in yields may appear surprising in view of greater luxuriance of the tropical rain forests when compared with the coniferous forests. However, although there are more than 2,500 species of trees in Malaya, only a few of these produce timber which is commercially acceptable. Again, the commercially valuable trees are the large, top-storey dominants, and there are fewer such trees per unit area in the rain forest than in the temperate forests, and these are also generally smaller in size and produce less timber than the giant conifers. Another cause of low yields is the greater susceptibility of tropical timbers to decay and insect depredations in the living trees, so that the final recovery of saleable wood is significantly lower.

The major forest products are timber, poles, firewood and charcoal. Table 2 shows production in 1958.

Half of the total annual yield of these forest products is from Forest Reserves and half from unreserved forests. Production has increased steadily since the war, and present production is two and a half times that of 1946.

The exploitation of timber in Malayan forests is difficult because of the great number of different species of trees of various sizes scattered over a wide area. It is not unusual to find an average of only one tree of commercial value in several acres of forest. This is particularly so where the heavy hardwoods are concerned; patches of twenty to a hundred acres in extent in eastern Malaya may have only two or three

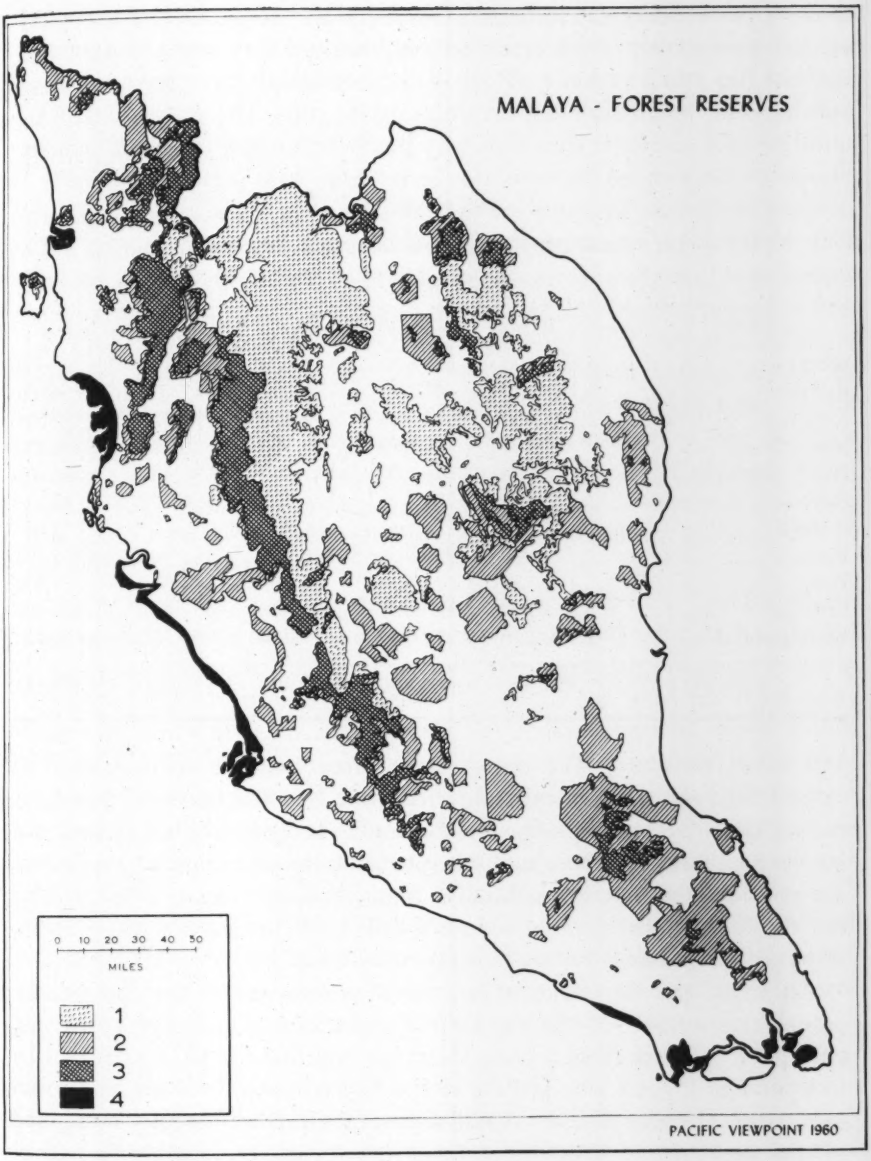

Fig. 7. Forest Reserves of Malaya.

1. All other land over 1,000 feet 2. Forest Reserves below 1,000 feet. 3. Forest Reserves above 1,000 feet 4. Mangrove Reserves.

trees of marketable size in them. There are also some species that yield second-class timber which could be sold locally if they could be extracted without too much expense. Most of the remaining trees have wood so soft as to be worthless even for firewood or pulp. The practical exploitation of such forests is therefore very much dependent upon accessibility

TABLE 2

Production of Timber and Fuel, 1958

(Solid Cubic Feet)

STATE	ROUND TIMBER	POLES	FIREWOOD	CHARCOAL	TOTAL
Johore	16,665,900	181,800	1,542,300	372,600	18,762,600
Kedah	4,167,200	83,100	182,100	482,400	4,914,800
Kelantan	2,211,500	12,400	136,400	179,000	2,539,200
Malacca	427,200	16,200	20,300	28,700	492,400
Negri Sembilan	6,276,600	39,100	12,300	133,400	6,461,400
Pahang	13,220,300	23,700	374,200	221,000	13,839,200
Penang	4,000	1,200	1,800	—	7,000
Perak	7,733,000	780,900	2,768,900	6,982,900	18,265,700
Perlis	173,700	22,500	10,200	14,000	220,400
Selangor	4,378,200	389,000	1,783,300	657,100	7,207,600
Trengganu	2,320,200	10,300	931,000	106,300	3,367,800
TOTAL	57,577,800	1,560,200	7,762,800	9,177,400	76,078,100

and cheap transport. The more remote areas will be uneconomical to exploit because of excessive transport costs. Nor is it always possible to reduce costs by floating logs down-river as the working areas may not be near a suitable river, and also because many tropical hardwoods are not buoyant. In eastern Malaya logs are floated down in large rafts, but the rivers of western Malaya are little used for log transport. Poles, however, are floated down in large quantities.

Although the Government exercises control over the forests, the actual exploitation of the timber resources is in the hands of private enterprise. Timber from Forest Reserves and State land is extracted by independent loggers who sell the round logs to sawmillers for conversion into sawn timber. Some sawmills have their own logging areas and obtain their round logs direct from the forest. Sawmilling is one of Malaya's important industries. The first sawmills were established in the 1920s, and by 1940 there were eighty mills. The postwar period has seen a very rapid expansion of the industry, and there are now 400 mills employing 6,000 men, mostly Chinese. Expansion has in fact been over-rapid, with the result that some mills are as far as a hundred miles away from the source of logs. The Emergency has also had adverse effects on the industry, and security considerations have led to the siting of mills in towns rather than near forests, with resultant increase in costs. There have also been fluctuating and regional shortages of logs.

Many of the mills are undersized, and there has been no increase in efficiency in terms of output per labourer or per horsepower in the postwar period. The output of sawn timber from all mills in 1958 was 503,100 tons of 50 cubic feet, and the net exports of sawn timber totalled 221,500 tons of 50 cubic feet.

The mangrove forests are intensively worked to produce firewood, charcoal and poles. There are 463 square miles of mangrove reserves (346 square miles are productive). Small areas are clear-felled each year on a rotation of forty years. Felled areas are naturally regenerated and are ready for further felling at the end of the rotation period. There has been a marked decline in the demand for and the production of firewood and poles in recent years. Poles are used mainly in the tin mines, but due to changes in mining methods and restrictions on tin production the demand has fallen. Firewood production has declined steadily due to displacement by alternative and more efficient fuels, especially oil. There is, however, still a substantial demand for charcoal, sufficient in fact, to boost production from 84,000 tons in 1952 to 184,000 tons in 1958.

Apart from the major products of timber and fuel, the forests of Malaya also yield a number of minor forest products which are collected in small amounts and sold or bartered. The most important of these in terms of value are nipah (the leaves of which are used for the manufacture of *attap* thatch), rattan (used for making baskets, mats, rattan furniture, etc.), jelutong, gutta percha and other gums and resins collected by tapping species of trees of the families *Sapotaceae* and *Dipterocarpaceae,* and a large number of miscellaneous products such as incense wood, tanning and dyeing material, fibres, derris, medicinal plants, and a variety of food plants. The total revenue from such minor forest produce was only $M428,000 in 1958 while that from timber and fuel was $M13,507,000. Collection of minor forest produce has declined during the past decade due to the Emergency, but production is gradually recovering as the security situation improves.

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Recent Population Growth and Economic Development in Asia

MARION W. WARD

The decade of the fifties has been a decade of transition for Asia, during which the pace of change has accelerated. In this period the effects of political, economic and social developments have been so widely disseminated that few places remain untouched by their influence. It is the purpose of this paper to survey and measure recent trends of population growth and economic development in the Asian countries from Afghanistan to Japan.

POPULATION CHANGES

More than half (1,483 million) of the world's population (2,795 million) lives in south, southeast and east Asia. This area comprises, however, about one-sixth of the world's land area, and only a little more than one-tenth of the world's agricultural area. Within this Asian realm there occur regions having extremely high man/land ratios. Such high density areas as Java and the deltas of the great rivers differ from areas of equivalent density in Europe or North America in that their populations are largely rural and depend directly on the fertility of the soil for their livelihood. The 1958 populations of most Asian territorial units are represented diagrammatically in Fig. 1. Two giants, China and India, dominate. They are followed by Japan, Pakistan and Indonesia, each with about ninety million people, and Thailand, Burma, the Philippines and South Korea each with about twenty million.

During the last three centuries the population of Asia has grown less rapidly than that of Europe, North or South America or the world as a whole. In consequence the proportion of the total world population living in Asia declined relatively, as the share of Europe and the New World increased. This trend has been reversed in the twentieth century[1] however, as the rate of population growth in Asian countries has begun to accelerate. In general terms this may be accounted for by the continuing decline in mortality (particularly infant mortality) while fertility has generally remained high.

[1] According to United Nations (1959):5 the proportion of the world's population living in Asia and the Far East, which was about 51 per cent in 1920, rose to 53 per cent in 1950.

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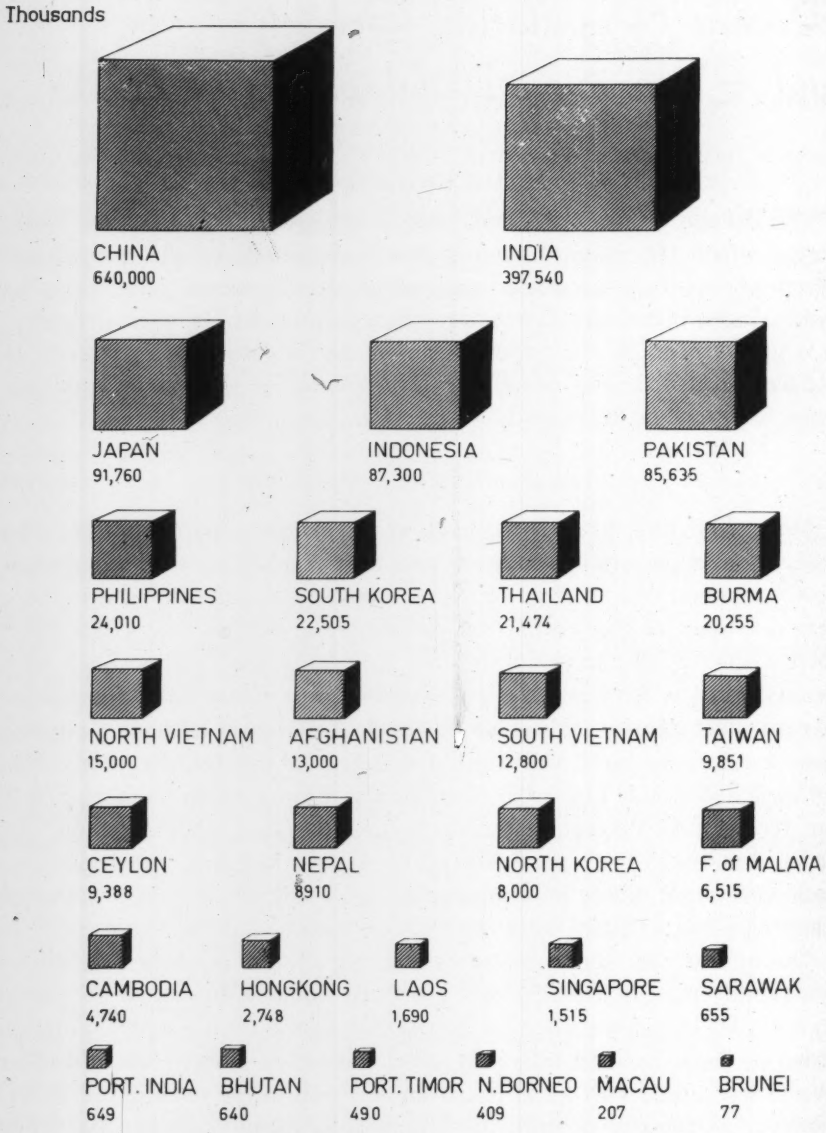

Fig. 1. Population of the Countries of Monsoon Asia.

Death rates in Asia have declined to 6-12 deaths per 1,000 persons, while rates for as recent a period as 1935-9 ranged from 16-24 per 1,000.[2] Birth rates, with one exception, remain high (28-57 live births per 1,000 persons). In 1935-9 they ranged from 29-46 per 1,000 persons

[2] The figures in this paragraph are from an incomplete list of Asian countries given in United Nations (1959):111.

This widening of the gap between birth rates and death rates leads to the marked rise in the crude rate of natural increase which is evident in mid-century Asia.

The absolute increase of population in Asian countries since 1951 is shown in Fig. 2. As is to be expected, the largest increases have occurred

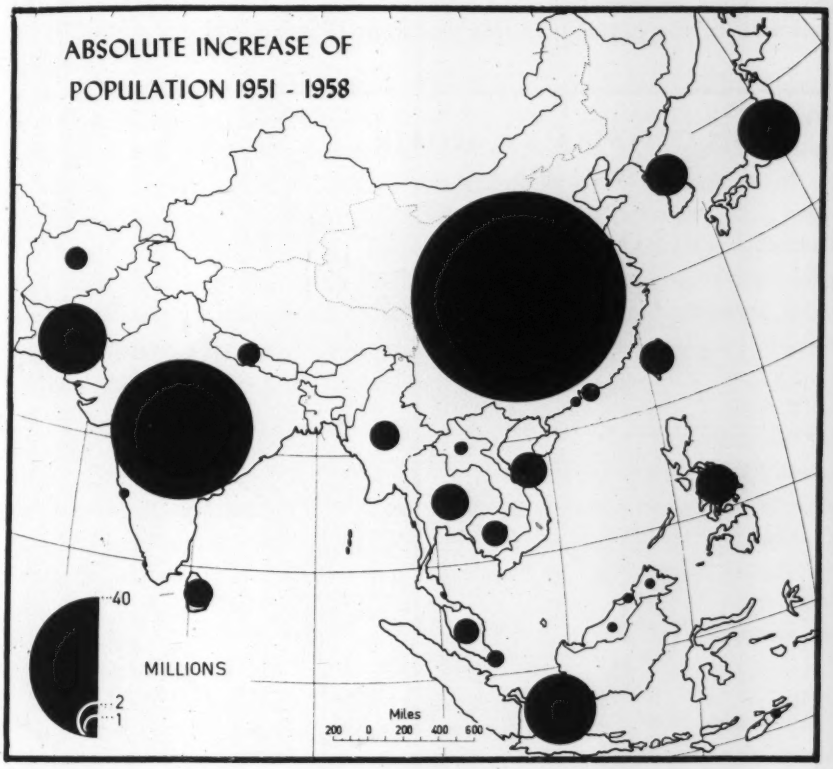

Fig. 2.

in China and India, the countries having the largest population bases. Noteworthy is the smaller size of the increase in Japan compared with that in Indonesia and Pakistan, indicating the effects of the decline in the birthrate (to 17.2 live births per 1,000 persons in 1957) which has been a significant demographic feature of the last decade in Japan.

Rates of population growth are shown in Fig. 3. The highest rates are recorded in Brunei, Singapore and Hong Kong, all of which are small territories with unusual economic bases or particular attractions for immigration. The second highest group comprises China, Taiwan, the Philippines, Laos, Cambodia, Malaya, Ceylon and North Borneo. Most of these countries have experienced marked declines in mortality in the post-war years while Taiwan and Laos have experienced in

addition an influx of population from other areas. The gap between birth rate and death rate is not as wide in the remaining countries, though both may be relatively high as in Burma (estimated birth rate 36.0, death rate 21.4 per 1,000 in 1957) or relatively low, as in Japan (birth rate 17.2, death rate 8.3 per 1,000 in 1957). A consequence of these vital trends is the generally youthful character of most Asian populations; in Singapore, for example, the 1957 census recorded that over half of the population was less than 19 years old.[3]

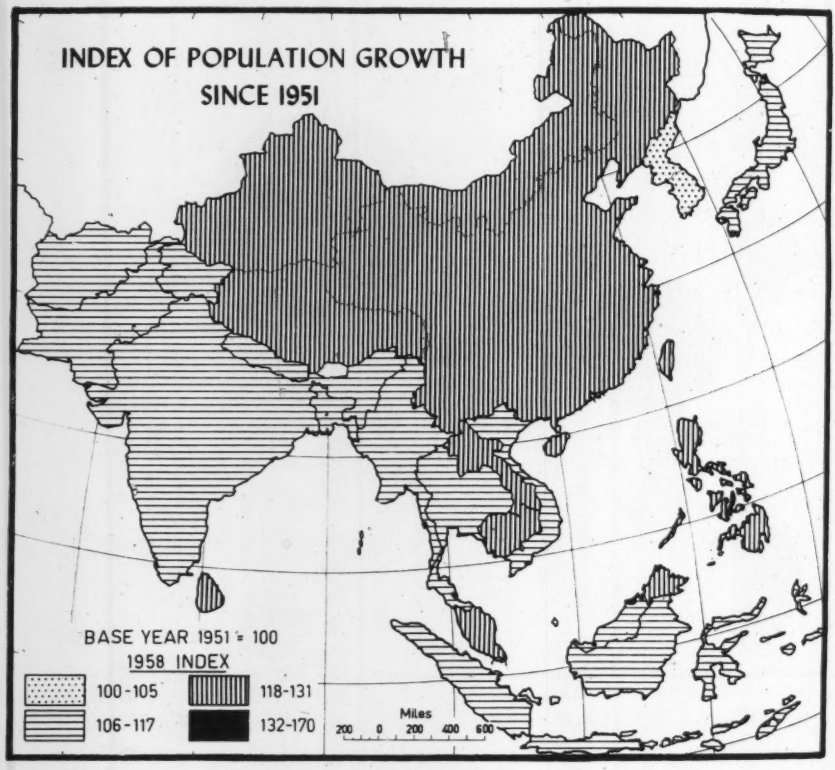

Fig. 3.

The population of Asia may be characterised today as passing through the early stages of rapid growth, which, if it continues at present rates on the existing large base, will result in numerical increases of phenomenal size. In Western Europe, concurrently with the establishment of an urbanised industrial society with its greatly improved living conditions in which life expectancy can be of the order of sixty years, the high birth rate of the nineteenth century declined and populations became relatively stable. While socio-economic conditions in Asia differ from those of

[3] *Straits Times* (28 November 1958).

Europe, making close comparisons unwise, it is possible that this trend may occur in Asian countries also. It has already happened in Japan, the most industrialised, the most urbanised, and the most "westernised" of the Asian countries. The present low birth and death rates, and an ageing population indicate a considerably retarded rate of natural increase for Japan in the immediate future.[4] They also indicate that, in favourable social and political circumstances, government action in promoting birth control campaigns can bring about rapid changes in the demographic situation.

At the present time it appears that Asian populations will continue to grow rapidly for at least the next two decades. Recent United Nations estimates[5] predict an accelerated rate of growth in all countries except Japan and possibly China, which will result in the Asian share of the world population rising from its 1957 figure of 53 per cent, to a value of 55 or 56 per cent by 1980. Two possible limiting factors are discernible, namely, the inability of Asian or world food production to keep pace with population growth, and the widespread adoption of birth control. Family planning clinics are operating in Japan, India, Pakistan, Ceylon and Singapore, and there is a generally favourable reaction to the principle in many parts of Asia. One other factor which may affect the rate of future population growth in Asia is the fact that all the processes of political, economic and social change taking place today are seemingly accelerated. Possibly because Asian nations are able to draw deeply on the experience of the West the period of transition is being shortened. It is possible that the stages in the cycle of population growth may also be compressed and the period of great population growth may be shorter than anticipated. Even if this occurs, however, immediate increases are likely to be large.

ECONOMIC CHANGES

In the face of this situation there is considerable concern over the ability of Asia to provide economic support for the twenty-five or more millions being added to the population each year. It is possible to assess the recent situation in broad terms by considering the change in a number of economic indices available for some or all of the Asian countries. Of these, income per capita (Fig. 4) gives an indication of the present

[4] The preferred estimate of Taeuber (1958): 386, predicts an increase of 22.2 million from 83.4 million in 1950 to 105.6 million in 1980. This increase is at the low average annual rate of 0.8 per cent, compared with that from 1920 to 1950 of 1.37 per cent. She points out (pp. 388-89) that, while the 1980 population will have an increased proportion of aged people and a decreased share of young people, the numerical increase of men of working age (20-64) will be 14 million, and that they represent a 70 per cent increase on the number of men of that age group in 1950.

[5] United Nations (1959):4.

economic status of most Asian populations. Japan, with its long period of modern economic development; Malaya, with its rubber and tin base developed by British and Chinese capital over half a century; and Singapore and Hong Kong with their specialised trading and light industrial economies lead Asia, though per capita incomes in these countries are less than one quarter of those of New Zealand or the

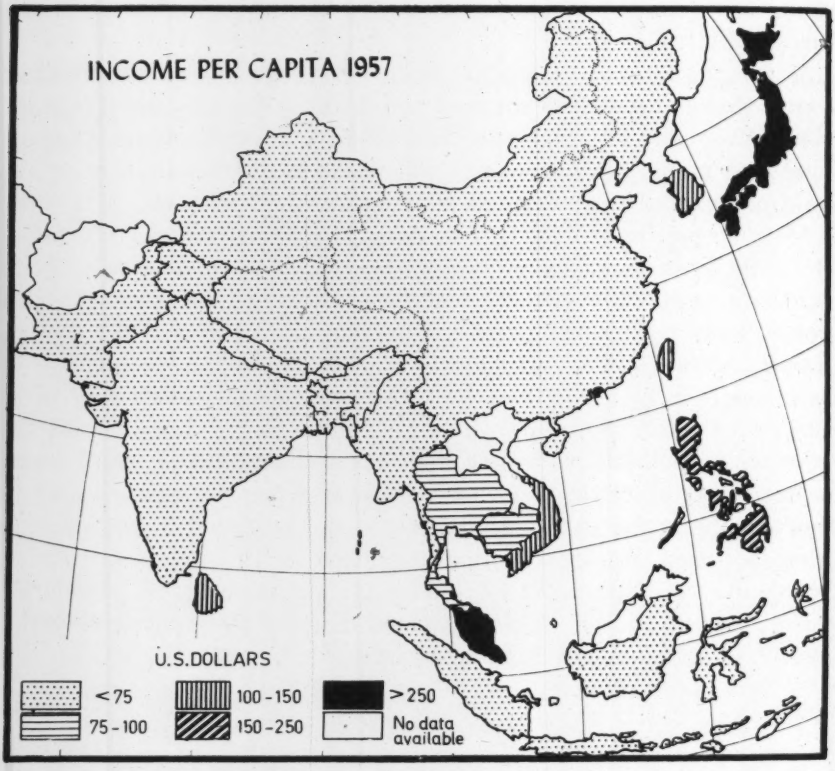

Fig. 4.

United States of America. The Philippines, a country which has received considerable external economic investment, shows a relatively high per capita income, while the moderately high rank of South Korea, Taiwan and South Vietnam on this map reflects the relatively large amounts of economic aid they have received from external sources. By far the largest segment of Asia's population still subsists on a per capita income below $(U.S.)75 a year, despite the efforts that have been made to raise it in recent years.

These efforts are more clearly shown in Fig. 5, which portrays areal differences in rate of change of per capita income from 1953 to 1957. High rates of increase have been achieved by China, Taiwan, South Korea and Japan. The two first-named countries have also shown high

rates of population growth since 1951 (Fig. 3) though a comparison reveals that their per capita incomes are rising faster than their populations. India, Burma, Cambodia and the Philippines record an increase of per capita income at moderate to low rates ranging between 0.7 to 3.3 per cent. Cambodia and the Philippines show a moderately high rate of population growth, while population growth rates for India and Burma are fairly low. The four countries with negative rates of change

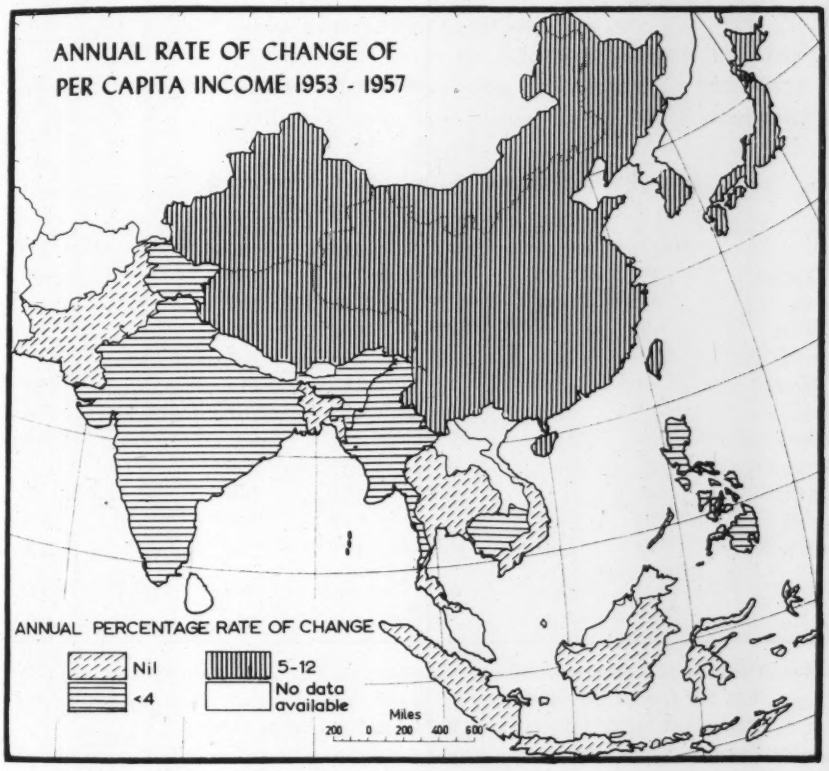

Fig. 5.

of per capita income (Pakistan, Indonesia, Thailand and South Vietnam) have all undergone currency devaluation within the period 1953 to 1957. This has resulted in a nominal decline in the income per capita in terms of U.S. dollars. Even if real income per capita has not declined, it is certain that it has not increased significantly in any of these four countries during the last decade.

Another rough indicator of national economic levels is the ratio of population to motor vehicles. Singapore, the Federation of Malaya, Ceylon, Hong Kong, Brunei and North Borneo (the last two with very small populations) lead in Asia, with the first two states having one vehicle to every twenty people. In 1948 most of these countries had almost twice as many people per motor vehicle. Japan and the Philip-

pines both had about 150 people per motor vehicle in 1957 and this represented a decrease from their 1948 figures of 492 and 228 respectively. At the other end of the scale India, Pakistan, and South Korea had 1,007, 1,600 and 820 people per motor vehicle in 1957; in 1948 they had 1,696, 2,050 and 1,531 respectively. Though comparable figures are not available for China or North Korea, it is likely that they too fall in this category. While numbers of people per motor vehicle is only a very broad index, it does give some indication of the base for future development, for without vehicles and roads economic advance is slow and areally limited.[6]

The trend of agricultural production in a number of Asian countries is shown in Table 1.

TABLE 1

Index Numbers of Agricultural Production

1952/53 - 1956/57 = 100

	1952/53	1953/54	1954/55	1955/56	1956/57	1957/58	1958/59
Pakistan	99	97	102	98	105	103	100
India	91	101	101	103	105	104	106
Ceylon	94	95	101	108	102	105	108
Burma	102	98	97	96	107	92	107
Thailand	89	106	85	105	115	93	106
Malaya	95	93	99	105	108	108	110
Indonesia	93	98	106	102	102	103	105
Philippines	93	98	99	101	109	111	111
Taiwan	96	97	100	101	108	114	117
Japan	96	85	94	114	110	115	118
South Korea	86	105	105	106	98	107	109
	1952	1953	1954	1955	1956	1957	1958
China	92	95	98	105	111	113	143

Notes: This index applies to all agricultural commodities, but it closely follows that for food crops only, except in the case of Ceylon, which shows a more condensed range (from 97 to 101) for food crops alone.

The series for China is "Growth of Gross Output Value of Agriculture", Base 1952 = 100, 1958 figure adjusted to conform to 1952 prices used for earlier years.

It will be noted that the United Nations base is an average over five years, presumably to smooth out inequalities due to good and bad seasons.

Sources: United Nations (1959) p. 16: the countries listed are the only ones for which data is given by the U.N.; State Statistical Bureau, (1960):118.

[6] The figures quoted are based on the total number of motor vehicles. It is obvious however, that the number of commercial vehicles is more significant to a country in the process of economic development than is the number of private cars. Analysis of the available data shows that the ratio of commercial vehicles to private cars is highest (over 1) in Japan (1.9), South Korea, Brunei, Taiwan, Thailand, the Philippines and Burma. Data for China, North Korea and North Vietnam are not available; the figures might be expected to fall at the high end of the range. The indicator value of vehicle figures is lessened by the presence of developed alternatives, such as inter-island shipping in the Philippines.

The general tendency over these seven years has been toward an increase in agricultural production, but in varying degrees for different countries. Most notable is the 1958 increase indicated for China, which stands ahead of all other Asian countries. Japan and Taiwan show medium increases but the remaining large countries such as India, Pakistan and Indonesia show relatively little progress. If the table is compared with the rate of population growth shown in Fig. 3, it is seen that only China, Japan and South Korea have agriculatural indices in advance or equal to their population growth indices for 1958. India, Burma, Thailand, Taiwan, appear to be breaking about even, while in Pakistan, Ceylon, Malaya, the Phillippines and Indonesia, the increase in agricultural production is definitely lagging behind the rate of population growth.

The second table traces the growth of industrial production for a number of Asian countries over the last six years.

TABLE 2

Index Numbers of Industrial Production

1953 = 100

	1954	1955	1956	1957	1958
Pakistan	128	161	182	192	215[a]
India	107	116	126	130	132
Ceylon	100	112	110	109	105
Taiwan[b]	107	119	125	142	149
Japan	108	117	144	167	168
South Korea	100	119	143	187	195
China[c]	117	126	165	183	—
China[d]	116	123	157	175	291

Notes: [a]Provisional.

[b]Includes sugar production.

[c]Value index of gross industrial production at 1952 prices (United Nations figures).

[d]Official Chinese figures. Gross output value of industry; base 1953 = 100; 1958 figure converted to equivalent 1952 prices to conform with earlier years; at 1957 prices the index is 261.

Sources: United Nations (1959):119. State Statistical Bureau (1960):87.

Again the greatest increase is shown by China. Though progress to 1957 was great, the exceptionally high value for 1958 is the response to the call for a "Great Leap Forward" in that year[7], but it must be recognised that this figure probably includes steel made by "indigenous methods". The high figures shown by Pakistan and South Korea are somewhat misleading since they are a reflection of the fact that both

[7] Further discussed below.

countries started from a negligible base. The figure for Japan measures the remarkable expansion of the rebuilt Japanese industrial sector in the last few years. India's industrial index is well ahead of its agricultural one, reflecting the industrial advances promoted by the first two Five Year Plans. When the industrial production indices are compared with the rates of population growth (Fig. 3), China, Japan, India, Pakistan, Taiwan and South Korea all show industrial growth well ahead of their rates of population increase. In Ceylon, however, industrial development lags behind population increase and it is probable, though statistics are not available, that this situation is found in most Southeast Asian countries. Indeed, compared with Japan and China, industrialisation in Southeast Asia has hardly started, and such industry as exists is usually based on locally-produced agricultural raw materials. The most notable development has taken place in Hong Kong where special circumstances have encouraged the development of metal product and textile industries supplying a wide export market.[8]

TECHNIQUES OF ECONOMIC PROGRESS

Planned economic development under the deliberate direction of the state is a comparatively new practice in the world. At this mid-century, however, it has become a common device for the most effective organisation of the transition from feudalistic agrarian societies to industrialised and more nearly egalitarian societies. It is evident that the employment of this method is one reason for the very much greater pace of transition in Asia than was the case in Europe.

China and India offer two variants on this general pattern; in China the economy is a fully planned one, with State control or participation as a dominant feature; in India, by contrast, the State's function has been largely supervisory, though the State directly controls certain strategic sectors of the economy. The starting base for both countries, as reorganised a dozen years ago, was remarkably similar, and is typical of most other Asian countries.[9]

Both India and China were predominantly agricultural nations with modest industrial beginnings. While India had a functioning primary iron and steel complex in the Bengal-Orissa area, that at Anshan was not an effective part of the Chinese economy for some time after 1949. In both countries a variety of light consumer industries were well established and there was a high proportion of cottage and handicraft industries. Agricultural methods in both were primitive, resulting locally in high yields per acre but generally in low yields per man. Land holdings were small and fragmented, while land rents were high. Quite extensive railways systems existed, but communications were generally poor, and

[8] See Szczepanik (1958).

[9] Material in this paragraph is based on U.S. Government (1956): 2-13.

isolation tended to intensify the effects of famine and natural disasters when they occurred. Both countries suffered periodic floods and droughts and severe soil erosion. Potentially irrigable land was available in both. In both India and China there existed great internal population pressure, and per capita incomes and levels of living were extremely low.

Both countries proposed major development plans which are being executed on the basis of successive five-year periods. India's first Five Year Plan (which ran from 1951-6) called initially for an outlay of some Rs.20,690 million ($(U.S.)4,343 million). The second (1956-61) required some Rs.71,500 million ($(U.S.)15,000 million) and the third calls for an outlay of $(U.S.) 21,420 million. China's first Five Year Plan (1953-7 inclusive) provided for a total outlay during that period of 76,640 million yuan ($(U.S.)32,600 million) of which some 42,740 million yuan were for capital construction. The total financial outlay proposed for the second Chinese Five Year Plan is not available, but Hughes and Luard[10] suggest "state investment in capital construction might be about double what it was during the first Five Year Plan", and it is obvious that total expenditure on the second plan will be greater than that on the first. The initial emphasis of development differed in the two countries as Table 3 indicates.

TABLE 3

Indian and Chinese Five Year Plans: Initial Proposed Outlays by Percentages of Totals.

	India		China
	First	*Second*	*First*
Agriculture and Community Development	15.1	11.8	—
Agriculture, Water Conservancy and Forestry	—	—	8.0
Irrigation and Power	28.1	19.0	—
Industry and Mining	7.6	18.5	40.9
Transport and Communications	23.6	28.9	11.7
Trade, Banking and Stockpiling	—	—	2.8
Municipal and Public Utilities	—	—	2.8
Other Items of Economic Construction	—	—	15.2
Social Services	22.6	19.7	18.6
Miscellaneous	3.0	2.1	—
Total	100.0	100.0	100.0

Sources: Government of India Planning Commission (1956):51-52. United Nations (1958):91.

Planned Development in India

In India the long term goal is the establishment of a "socialist pattern of society". The Indian Planning Commission elaborates:

[10] Hughes and Luard (1959): 65.

"Essentially this means that the basic criterion for determining the lines of advance must not be private profit but social gain, and that the pattern of development and the structure of socio-economic relations should be so planned that they result not only in appreciable increases in national income and employment, but also in greater equality in incomes and wealth. The benefits of economic development must accrue more and more to the relatively less privileged classes of society, and there should be a progressive reduction of incomes, wealth and economic power."[11]

The first Five Year Plan in India achieved considerable results in raising the national income by 18 per cent and the per capita income by 11 per cent. The generation of electric power increased from 6,575 million kWh in 1950-1 to 11,000 million kWh in 1955-6. Industrial production was, by 1955, some 22 per cent higher than in 1951, while agricultural production had also increased, that of foodgrains at between 3-4 per cent per year to a total five-year rise of 20 per cent, cotton by 45 per cent, oilseeds by eight per cent. Sixteen million acres of land benefited by irrigation works.[12] The primary emphasis was on the improvement of agriculture and, through the Community Development Programme, the living conditions of the peasant farming communities, and in laying the foundations for greater industrial development to follow during the second Five Year Plan.

The aims of the second Plan were: (a) a sizeable increase in the national income so as to raise the level of living in the country; (b) rapid industrialisation with particular emphasis on the development of basic and heavy industries; (c) a large expansion of employment opportunities; and (d) reduction of inequalities in income and wealth and a more even distribution of economic power.[13] This plan envisaged a much faster rate of increase in the national income and thus in the per capita income and standard of living. There was to be more rapid industrialisation, particularly in the heavy industry sector and in the output of producer goods.

The results of the second Plan are uneven. Undoubtedly major advances have been made in industry, particularly in laying the foundations of future heavy industry, of which the steel plants at Rourkela, Bhilai and Durgapur are symptomatic. The index of industrial production was 154 in 1959 compared with 100 in 1951,[14] and this index underrates the importance of newer but rapidly growing industries such as chemicals and chemical products, general and electrical engineering. In agriculture, however, the thick crust of ancient custom has proved hard to break and the unsolved problems of land tenure, heavy debt burden,

[11] Government of India Planning Commission (1956): 22.
[12] Government of India Planning Commission (1956):2
[13] Government of India Planning Commission (1956):24.
[14] *The Economist* (26 March 1960): 1277

caste and disinclination towards sustained hard work have impeded progress.[15] While "the results (of the Community Development Programme) so far have . . . been extremely uneven, seven years of development work have, however, made a vast difference to the interest and receptivity of millions of farmers. The farmer is coming to demand fertilisers, better seed, more tube wells, and a good road to market."[16]

The difficulties deriving from over-optimistic planning, heavy defence expenditure, unexpectedly rapid population growth, and poor harvests reached a peak in the exchange crisis India suffered in 1957. This was weathered through economic assistance received from the United States, Britain, West Germany and Japan, and by a more favourable harvest in 1958-9. Since the balance of payments crisis was precipitated by the need for food imports and for the materials of industrial development, the emphasis in the approaching third Five Year Plan has to be on sectors which will reduce dependence on foreign supplies, namely food, steel, oil and engineering.

A draft outline of the third Five Year Plan released in July 1960, stated that the Indian government hopes to increase the national income by 30 per cent (i.e faster than in either of the two preceding Plans); increase grain production from 70 million tons to 105 million tons; increase steel ingot production to 10,200,000 tons; and double power output. The Plan also envisages the provision of more employment, more education and improved communications and water supplies in the villages.[17]

The following table illustrates the greater emphasis on the development of industry in the third Indian Five Year Plan.

TABLE 4

Tentative Structure of Investments

(Public and Private Sectors Combined)

	Percentages of Totals	
	Second Plan	*Third Plan*
Agriculture and Irrigation	16.8	16.0
Power	7.1	10.0
Industry and Mining	22.1	26.0
Transport and Communications	23.2	17.0
Stocks and Miscellaneous	6.6	9.0
Housing and Social Services	24.2	22.0
	100.0	100.0

Source: *The Economist* (26 March 1960): 1269.

[15] Dumont (1959).
[16] *The Economist* (26 March 1960): 1274.
[17] *The Auckland Star* (6 July 1960).

State Planning in China

Central planning in China has been described in the first instance as "an instrument for achieving progressive socialisation of the means of production."[18] While the Chinese would probably generally agree with the broader stated aims of the Indian government, the means they have adopted for their economic development have been much more drastic and disruptive to the existing society, and they have resulted in much greater relative advances, particularly in industrial production and in income per capita. The first Five Year Plan in China laid strong emphasis on the development of basic heavy industry, and particularly on the rehabilitation and expansion of the primary iron and steel complexes at Anshan and Wuhan and the development of new ones at Paotow and Hankow. The underlying principle was stated by Wang Kuang-wei, Secretary General of the State Planning Commission to be that:

". . . The continued growth of the national economy can be assured only if priority is given to development of heavy industry. Only this can bring about a steady rise in the material well-being of the people and their cultural growth."[19]

The physical achievements of the Chinese during the first Five Year Plan and the early years of the second have undoubtedly been great. The build-up of industry and the reformation of agriculture have resulted in a transformation of the appearance of the land;[20] in a re-ordering (through the construction of new railways and roads, the development of interior industrial centres, and the extension of agriculture and settlement into "new" lands) of the economic geography of China;[21] and in a re-organisation of Chinese society. As in India, however, achievement was uneven, and in 1956 the economy underwent considerable strain originating from a too rapid pace of development. The Government was forced to meet this by slowing down the rate of development, and increasing the production of consumer goods.[22]

Proposals for the second Five Year Plan (1958-62) were drawn up in 1956; the proposed targets have been published, though they have been subject to continual revision, at first upward, but in 1959 downward. Thus the steel production target for 1959 was reduced from 18 million metric tons to 12 million metric tons (compared with the 1958 target of 11 million and production of 8 million metric tons). Similarly the cotton target for 1959 was reduced from 5 to 2.31 million metric tons (compared with the 1958 target of 2.25 million metric tons, and pro-

[18] United Nations (1958):88.
[19] U.S. Government (1956), quoting *People's China,* Aug. 1, 1955:5.
[20] Buchanan (1960): 11-38.
[21] Hughes and Luard (1959):96-109.
[22] Hughes and Luard (1959): 52-58.

duction of 2.1 million metric tons). The 1959 coal target is set at 380 million metric tons compared with a 1958 production of 270 million metric tons. The 1959 grain target was at one time as high as 525 million metric tons, compared with the 1958 target of 375 million metric tons and production of 250 million metric tons. The 1959 target was later reduced to 275 million metric tons.[23]

Although some of this reduction may have been necessitated by over-enthusiastic estimation of yields, the underlying causes (so far as agricultural products are concerned) have been the as yet unconquered problems of severe floods and droughts. Recent evidence of a serious food shortage in China comes from a news correspondent in Hong Kong[24] who quotes the Kwangsi branch of the Chinese Communist Party as saying, "We are still unable to produce enough grain to meet the present need". He further states, "Experts believe that in 1959 China's food production totalled around 170 million tons, some 10 per cent lower than the 1958 figure."

The yearly production figures for contemporary China are evidence, despite all allowance one cares to make for optimistic reporting or for deficiencies in quality, of the tremendous progress that has been made in a unified China, with the energies of its vigorous population channelled into productive use. The year 1958 marked two important steps along the path of Chinese development. In February a call was made for a "Great Leap Forward" over the succeeding three years, and dramatic increases in targets for industrial and agricultural production were proclaimed. Special emphasis was placed on the establishment of small and medium-sized locally-controlled enterprises. Secondly, in August, came the announcement of the formation of the "People's Communes". The organisation of these communes had begun in April 1958, and by the end of September some 90 per cent of the peasantry were reported to be organised into 23,397 communes.[25]

The communes, which were formed from the merging of existing co-operatives, involve the grouping together of from 10-40,000 people

[23] All figures used in this paragraph are drawn from the communiqué issued after a plenary session of the Chinese Communist Party held 2-16 August 1959 at Lushan, Kiangsi Province, as reported in *Keesing's Contemporary Archives, 1958-9* (12-19 September 1959): 16994.

[24] *The New Zealand Herald* (12 August 1960). See also reports in *The New Zealand Herald* (24 August 1960) of widespread threat of drought, flood and insect pests, causing damage to the food harvest.

[25] *Keesing's Contemporary Archives* (22-29 November 1958): 16511. According to the State Statistical Bureau (1960):43 by late September 1958, 98 per cent of the total number of peasant households were in 26,425 people's communes and by the end of December 1958, 99.1 per cent were in 26,578 people's communes.

(in some cases as many as 300,000) into a single economic, administrative and military unit. In their fully developed form all land, livestock and tools are publicly owned. The elected council is responsible for the organisation of agriculture, industry, trade, banking, education, hospital, postal service and militia. Women are released for productive work by the establishment of communal dining halls and day nurseries, and the organisation of teams to perform community duties. In some cases there are communal living quarters. The members of a commune receive the basic wage and bonuses, free food, and sometimes free clothing and other services.[26] Hughes and Luard[27] believe that the basic reason for the establishment of the communes at this time was an economic one, namely to provide more efficient control and operation of increasing local industrial activity, and to free women for work in the fields, thus releasing the men for work in mines, blast furnaces and repair shops. The new communes became the focus for the drive to set up new, small, industrial undertakings, the output of which contributed to the meeting of ambitious production targets called for by the "Great Leap Forward".

An Interim Evaluation

Direct comparisons of the progress made in ten years in India and China are not easily made. The employment of different methods for the preparation and execution of development plans has permitted different emphasis within each country, leading to slightly different ends. China's aim is state socialism involving the expansion of state ownership and reduction or elimination of private ownership in all areas of production and distribution. India's aim is to develop the economy on the basis of private ownership, but with state ownership of enterprises beyond the capacity of private industry or vested with an over-riding public interest.[28] In practice development in China has been through the execution of a tightly-conceived plan, which, despite the apparent grass-roots spontaneity of target setting and attainment, is fairly rigidly controlled by the government.

In India the patient eliciting of co-operation from impoverished peasants, and the lack of fiery ideological drive, has meant a slower rate of change. In both countries the Five Year Plans are part of long-term development schemes covering at least 25 years in India, and in China as long as 50 years in such cases as the control of the Yellow River. In China, however, there has been a greater emphasis on the attainment or exceeding of annual targets which are broken down from the five year goals. It is obvious that China has made greater and

[26] State Statistical Bureau (1960):43.
[27] Hughes and Luard (1959): 69.
[28] U.S. Government (1956):47.

faster progress than India, but at the cost of strain on the economy, the land, and the human base.

Progress in Southeast Asia

Planned development such as that undertaken by India and China is possible only where there is strong and stable government. The relative lack of large scale economic development in the countries of Southeast Asia over the last decade may be at least partially attributed to weak or unstable government.

In Malaya, with perhaps the strongest government in Southeast Asia (despite the ten-year "Emergency" now ended) the need for planned development was recognised and a Five Year Development Plan prepared in 1956. Excluding money allocated to the "Emergency" and the armed forces, the proposed allocation was 60 per cent to the economic sector; 30 per cent to the social sector; and 10 per cent to the government sector. First priority in civil development was allocated to the rubber industry on both estates and small-holdings, general agriculture, mining industries, a sound land utilisation policy, stimulation of industrial development, and the construction of the North Klang Straits port project. Second priority was given to the implementation of a new educational policy, health services, and urgent water supply schemes; third priority was allocated to housing, communications and power; and fourth priority to government buildings. In addition, major hydro-electric and drainage schemes are proceeding outside the Five Year Plan. Visible effects of economic development in Malaya include about half a million new or replanted acres of rubber, new and improved roads, new power plants at Klang and Malacca, and new industrial establishments in a number of towns.

Development in Southeast Asia cannot be on so great an overall scale as that in China and India, due largely to the inherent political fragmentation of the area. The two major actual or potential development schemes of international effect are the multi-purpose development of the Mekong River which affects Laos, Cambodia, Thailand and South Vietnam, and the hypothetical federation of Malaya, Singapore, Sarawak, Brunei, North Borneo and possibly Sumatra into a Malay-dominated political unit which would be able to draw on its rubber, petroleum and tin wealth for the economic development of backward parts. The absence of strong political organisation and the limited financial resources of many of the governments of this area have made effective economic development very difficult. National states are unable to implement major development schemes and external private enterprise is reluctant to invest in economic enterprises in these countries. The receipt by some southeast or east Asian countries of relatively large amounts of aid from

foreign governments is often a reflection of their own political instability or strategic value.

THE ROLE OF EXTERNAL AID

The financing of economic development in Asia is a formidable problem. The two ways of meeting it have been the utilisation of internal financial resources, and the use of aid, either grant or loan, from external sources.[29] The larger countries have had greater internal resources on which to draw and the same is true of the restored Japanese economy. All countries in Asia have received considerable amounts of external aid in the form of financial or technical assistance. The three major sources have been the U.S.A., the U.S.S.R., and the Colombo Plan in which the United Kingdom, Australia, Canada and New Zealand have been major donors.

TABLE 5
External Economic Aid 1946-58

	From Colombo Plan	From United States	Total aid to 1958	Total aid per head of 1958 population $/capita
	thousands $(U.S.)			
Taiwan	—	1,597,900	1,597,900	162.2
South Korea	—	2,481,400	2,481,400	110.3
Laos	759	165,400	166,159	98.3
South Vietnam	1,227	1,009,400	1,010,627	79.0
Philippines	298	1,029,000	1,029,298	42.9
Cambodia	745	148,800	149,545	31.6
Japan	—	2,499,400	2,499,400	27.4
Pakistan	77,196	715,300	792,496	9.3
Thailand	867	181,600	182,467	8.5
Afganistan	--	100,300	100,300	7.7
Ceylon	19,442	36,900	56,342	6.0
Burma	2,636	88,000	90,636	4.5
Indonesia	6,978	319,400	389,378	4.5
India	100,263	1,293,200	1,393,463	3.5
Nepal	105	17,600	17,705	2.0
North Borneo	578	—	578	1.4
Malaya	2,904	1,300	4,204	0.7
Sarawak	410	—	410	0.6
Singapore	727	—	727	0.3
Brunei	20	—	20	0.5

Notes: [a] Colombo Plan aid from United Kingdom not incluuded. This is especially high for India, Malaya, and British Borneo.
[b] U.S. aid under Colombo Plan not included.
[c] U.S. aid to Indo-China before partition not included.
[d] U.S. aid to Taiwan covers period 1949-58 inclusive.

Sources: Compiled from *The Colombo Plan, Seventh Annual Report of the Consultative Committee, 1958* and International Co-operation Administration, *U.S. External Assistance, Obligations and other commitments, 1 July 1945 through 30 June 1959.*

[29] See, for example Bonné (1957): 184-229, for a fuller discussion of the problem.

Table 5 gives an incomplete indication of external economic aid to some Asian countries. The apparent dominance of the United States as a source would be lessened were the total contributions of the United Kingdom and the U.S.S.R. included. This inclusion would raise India to near the head of the list in absolute terms. Though the aid recorded here is economic and specifically excludes military assistance, it is interesting to observe that the countries with high per capita aid figures, namely, Taiwan, South Korea, Laos and South Vietnam, have considerable political significance to the United States.

Aid from the U.S.S.R. to China has not been included in the table. Hughes and Luard consider that Soviet aid in the form of technical assistance, low-interest loans, and industrial exports was a vital factor in Chinese development during the first Five Year Plans.[30]

> In his budget speech in July 1957 Li Hsien-nien, the Minister of Finance, said that, since the founding of the People's Republic, Soviet aid amounted to 5,294 million yuan (about £750 million). This amount, though substantial, is not huge in relation to China's needs. . . . It compares with a total of 350 million and £600 million in external aid provided for in the first and second Five-Year Plans of India.[31]

In addition to external aid received by Asian countries there is a small but possibly increasing extension of aid between Asian countries. Examples are found in the aid extended to North Korea and North Vietnam by China; from Japan to some Southeast Asian countries; and amongst south and southeast Asian countries under the Colombo Plan.

Economic development is proceeding at an unprecedented rate in Asia today. It is characterised by national development programmes financed at least partially by outside assistance. In the two largest countries mid-century development is affecting the lives of virtually all the population, economically, politically and socially. The small countries of Asia would appear to be lagging in economic progress when compared with Japan, China and India and there may well arise a situation where these countries, particularly Japan and China, are in the position of donor nations to their less advanced neighbours. The crucial problem for the future is the ability of economic progress to keep pace with population growth. The indications seem to be that this may be achieved in Japan, China, and India, but is less likely in such fast growing areas as the Philippines, Java and East and West Pakistan. In all countries political stability is a pre-requisite for economic advance on a scale adequate to meet the demands of the growing populations of Asia.

[30] Hughes and Luard (1959): 72.
[31] Hughes and Luard (1959): 77.

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NOTES ON MAPS

1. The boundaries on this series of maps are arbitrary and their use does not imply acceptance by the author or by *Pacific Viewpoint*.
2. For convenience Kashmir has been shaded according to the pattern for India.
3. *Sources of data*:

   Figure 1—United Nations, *Economic Survey of Asia and the Far East 1959*, p. 110.

   Figures 2 and 3—United Nations, *Economic Survey of Asia and the Far East, 1959*, p. 110; 1951 totals for China, Laos, Cambodia, Nepal estimated by extrapolation; 1951 totals for North and South Korea U.N. estimates.

   Figure 4—United Nations, *Economic Survey of Asia and the Far East 1958*, pp. 160, 176. India, China, Thailand, South Vietnam, 1956; Indonesia 1955; Hong Kong 1954; Federation of Malaya and Singapore 1953.

   Figure 5—United Nations, *Economic Survey of Asia and the Far East 1958*.

A Method for the Social Grading of Areas

IAN POOL

It is implicit in much of urban geography that populations are socially homogeneous. This, of course, is not so, for societies consist of numerous groups which are differentiated in many ways. The differences are particularly marked in an urban, industrial society and may be based on one or a number of criteria; for example, ethnic characteristics, religion, age, sex, occupation, income, political affiliation and even language. In any study of urban societies, if the geographer is to achieve any depth or reality it is necessary for him to analyse two major types of social differentiation: demographic character, and socio-economic status or social grade.

Geographers have seldom analysed either the social grades of urban societies, or other social characteristics, although there are a number of studies of the residential structure of cities, most of which make passing reference to the social differences within urban societies.[1] Yet here is a field of urban geography which is basic to our understanding of the life, character and ecology of cities, and which is highly relevant in studies of city structure, particularly residential structure. Every urban dweller has some subjective idea of the differences in social grade between areas in his city; every city has its "slums", its "poor-class area", its "nob-hills", or its "better-class, more desirable areas". Unless such areas are defined quantitatively, relationships between social grades and other urban characteristics cannot be determined with any degree of validity.

The geographer who wishes to study social grading is presented with a number of problems. By what method can he analyse the major groups of an urban society? Can he employ areal differentiation? In other words, do the different social groups reside in sufficiently distinct areas within cities for a geographer to study the differences between one area and another, in order to analyse social differences? Furthermore, what

[1] e.g. Hoyt (1939); Pownall (1955): Chapter 12.

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criteria can he employ validly in order to analyse and map social differences and what data can he use? If he is able to determine that there are differences in social status, or social grade, between areas, what conclusions may he reach regarding the presence of social "classes"?[2] Finally, is an analysis of grades of areas an end in itself or can its results be employed further in studying types of social behaviour?

There are two possible techniques for defining the social grades or areas within cities. One technique, which has been employed by social anthropologists, sociologists and others[3] is to determine the social grade of a large number of individuals. Later an analysis is made of the proportions of individuals belonging to each of the various grades who reside in particular areas of the city. Obviously this technique requires a detailed knowledge of some of the inhabitants gained only from a long and intimate association. Furthermore, it can be applied only by trained investigators, and is costly. For these reasons, such an analysis of grade is too unwieldy for pilot surveys, and anyway is not at the level of generalisation desired by geographers.

Another method is to construct an index showing the overall social grade characteristics of a number of small areas within a city. Such an index would satisfy three needs.

First, it would quantify subjective notions on the distribution of areas of social grades in cities. This in turn could point the way for more refined and detailed studies.

Secondly, a composite index would synthesise related characteristics with similar distributions and thus could be used to complete surveys of single characteristics. Moreover, one characteristic may have an anomalous distribution in a portion of a city, thus invalidating an index constructed on this basis alone. By combining several characteristics individual differences could be submerged to a greater degree.[4] Furthermore, the greater the number of characteristics employed in an index the larger the range of possible index figures will be, and thus individual differences will be high-lighted more adequately.

Finally, the index could provide a measure of social grade which could be correlated with other characteristics in order to determine the relationship between social grades and their distribution patterns.

This paper will discuss the questions raised earlier and will describe a technique for the social grading of areas by reference to a survey of Auckland, New Zealand. In the Auckland survey census data were used and an index of social grade was developed which gave greater depth

[2] See p. 230 below.

[3] e.g. Warner and Lunt (1949).

[4] For example, the percentage of households without hot water services is one characteristic which has a distribution influenced largely by social grade. But since all State rental houses in New Zealand have this amenity, an index based solely on this single characteristic would be invalid.

and precision to the description of the social differences of areas. Later it enabled the author to note the relationships between social grade and other characteristics.

AUCKLAND SURVEY

In New Zealand today, as in other countries such as the United States, census data are collected for a comprehensive range of items. Furthermore, they are published in the form of an areal breakdown into small units of which the census division is the smallest. The range of items recorded and the areal breakdown are sufficiently detailed for social scientists to employ census data when studying comparatively small sections of the population.

Thus, in the Auckland Survey census data for groups of characteristics were processed, then the census divisions were ranked for each characteristic and graphed (Fig.1). The distribution of each characteristic

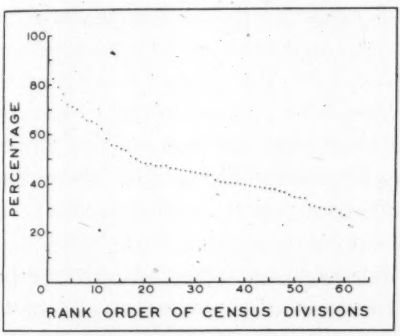

Fig. 1. Auckland Urban Area: Percentage of the total households in each census division *without* Washing Machines.
Rank order of census divisions: 1. Auckland Central 2. Newton 3. Grafton 4. Eden Terrace 5. Freemans Bay 6. Newmarket 7. Arch Hill 8. Ponsonby 9. Mt. Eden North 10. Parnell 11. Kingsland 12. Grey Lynn 13. Mt. Eden Central 14. Herne Bay 15. Morningside 16. Devonport 17. Epsom North 18. Rosebank 19. Sandringham (Mt. Albert) 20. East Coast Bays 21. Three Kings 22. Waterview 23. Remuera South 24. West Tamaki 25. Pt. Chevalier 26. Birkenhead 27. Westmere 28. Onehunga 29. Mt. Eden South 30. One Tree Hill 31. Avondale North 32. Sandringham (Mt Roskill) 33. Henderson 34. Takapuna 35. Ellerslie 36. New Lynn 37. Epsom South 38. Northcote 39. Mt. Albert Central 40. Remuera North 41. Royal Oak 42. Springfield-Owairaka 43. Otahuhu 44. Avondale South 45. Glen Eden 46. Orakei 47. Mt Wellington 48. Waitemata County (Part) 49. Papakura 50. Manurewa 51. St. Heliers 52. Mission Bay 53. Meadowbank 54. Papatoetoe 55. Manukau County (Part) 56. Franklin County (Part) 57. Howick 58. Halsey-Waikowhai 59. Hillsborough 60. Kohimarama 61. Glendowie

was then mapped. By studying differences between census divisions, major social differences between areas could be described. It seemed that a number of characteristics had similar patterns of distribution, and that this was caused by, or related to, some type of social grading, whereas the distribution of some other characteristics seemed closely related to the era of development. In order to satisfy the three needs which were defined earlier an index of social grade was evolved for Auckland.

CONSTRUCTION OF THE INDEX

It is necessary now to discuss the index with the aim of suggesting a social grading method which may be used in other surveys. The index is termed the Status-Possession Index. It is constructed in the following manner.

First, a number of characteristics are selected as possible criteria

of social grade. In the case of the Auckland survey the bases of selection were threefold. The first was whether or not the characteristics under review had been used in other studies on stratification and whether such use had been valid and effective. A second basis was, of course, to select characteristics which were desirable according to common sense expectations as to what constituted attributes of social grade. And thirdly, selection was limited, by the nature of the study, to the data available from the census. Data from other large scale samples may, of course, be employed provided an areal breakdown can be made which is consistent with the remainder of the data.

The characteristics, or, in other words, variables, selected are then ranked and graphed, as has been described for the Auckland survey. It should be noted that the groups of variables referred to are the broad headings under which a number of variables are listed in the census. For example, *Professionals*[5] is one of the sub-groups in the group *Occupation by Type*. As each group contained a number of variables not all could be used for the index. Furthermore, this was undesirable because some of the variables showed distributions which were not caused primarily by social grade. For example, the group *Occupation by Type* included two sub-groups—*Workers engaged in Primary Industry,* and *Workers in the Armed Services*. As most workers in the former category are farmers, distribution was largely limited to the rural-urban fringe. Similarly, in the second case distribution was influenced by the presence of large military installations.

In the third stage of the method, individual variables are selected for further testing which involves intercorrelation for the urban area as a whole. In the case of the Auckland survey the formula applied was Spearman's "Coefficient of Ranked Correlation".[6] The variables selected had been ranked already for graphing. The variables chosen for intercorrelation were eight in number. Three, *Labourers, Managers,* and *Professionals,* came from the group *Occupation by type;* one, *Employers,* came from the group *Occupation by Status*[7], one was *Density of Population;* and three, *Households without Washing Machines, House-*

[5] The full census term for this occupation group is *Professional, Technical and Related workers.* As the term is cumbersome the occupation group will be referred to as *Professionals.* Similarly *Craftsmen, Production and Process Workers, and Labourers* will be referred to as *Labourers* and *Managers, etc., etc.,* will be termed *Managers.* Census items are distinguished throughout the paper by italics.

[6] $\rho = 1 - \frac{6\Sigma d^2}{N(N^2 - 1)}$

This formula is described in most texts on statistics, e.g. Mills (1938): 374-378; Dornbusch and Schmid (1955): 195-197.

[7] The distributions of the remaining categories in this group were related only in part to social grade; e.g. the category *Wage or Salary Earner* was too wide in scope to be of any value in determining grade. Workers in the category *Own Account* were most commonly located on the rural-urban fringes where many probably owned and operated farms.

holds without Hot Water Services, and *Households without Refrigerators,* came from the group of data on *Household Amenities.* Correlations are made in order that the degree of relationship between variables which appear to have similar patterns of distribution for apparently similar reasons may be tested for a whole urban area.

A matrix showing the correlations is drawn up and by inspection[8] the highest intercorrelating variables are chosen for the index. When variables do not intercorrelate significantly the fault generally lies with either inadequate reasoning when selecting variables for correlation, or with inadequate data. In the survey of Auckland six variables were finally selected from the matrix. The two excluded were *Labourers* and *Density of Population.* The variable *Labourers* correlated significantly with only four of the other variables out of a possible of seven correlations. The reason seemed to lie in the inadequacy of the data. As can be seen from the full census term for the variable—*Craftsmen, Production and Process Workers, and Labourers*—the variable is extremely wide in scope. The other two variables from this group, *Managers* and *Professionals* are also wider in scope than is desirable for truly definitive work but this inadequacy is not as marked as for *Labourers* and thus they could be included on the index. *Density of Population* correlated poorly for reasons that are obvious. First, parks, reserves and vacant land affect the gross density. Secondly, the hypothesis that a higher density is related to lower social status is invalidated by the fact that new lower grade suburbs often have low densities. These two examples illustrate the value of testing by intercorrelation. In the case of *Density* inadequate reasoning could have invalidated the index had correlations not been made.

It should be noted that any variables may be selected, provided that the basic criteria applied when originally selecting variables are maintained. Thus the variables employed in the Status-Possession Index may change from study to study.

The next step is to obtain the "index figure" for each census division. This is done by summing the ranks of the highest intercorrelating variables for each census division. The figures so obtained are then ranked and graphed. As six variables were selected finally for Auckland and as there are 61 census divisions in the urban area, six became the minimum score and 366 the highest. The actual variation was between thirteen and 349.

The next step is to delimit arbitrary grades. This is done by making the widest gaps on the index graph limits of grades. As there were five wide gaps on the Auckland graph, six grades were delimited (Fig. 2).

[8] The final variables were selected by inspection in the Auckland survey because it was considered that a more complex mathematical analysis of intercorrelation was not warranted as the raw data was not sufficiently selective.

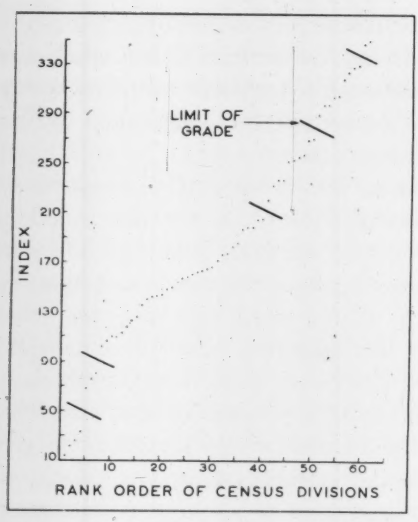

Fig. 2. Auckland Urban Area: Status-Possession Index.

Rank order of census divisions: *Lower-Lower Grade* 1. Eden Terrace 2 Freemans Bay 3. Arch Hill 4. Newton *Upper-Lower Grade* 5. Ponsonby 6. Kingsland 7. Grey Lynn *Lower-Middle Grade* 8. Onehunga 9. Newmarket 10. West Tamaki 11. Grafton 12. Auckland Central 13. Mt. Eden North 14. East Coast Bays 15. Birkenhead 16. Waterview 17. Glen Eden 18. Mt. Wellington 19. Sandringham (Mt. Albert) 20. New Lynn 21. Avondale North 22. Rosebank 23. Sandringham (Mt. Roskill) 24. Devonport 25. Three Kings 26. Parnell 27. Otahuhu 28. Avondale South 29. Morningside 30. Waitemata County (Part) 31. Henderson 32. Pt. Chevalier 33. Manurewa 34. Franklin County (Part) 35. Mt. Eden Central 36. Westmere 37. Ellerslie 38. Herne Bay 39. Papakura 40. Manukau County (Part) *Upper-Middle Grade* 41. Northcote 42. Mt Eden South 43. Takapuna 44. One Tree Hill 45. Springfield-Owairaka 46. Epsom North 47. Papatoetoe 48. Halsey-Waikowhai 49. Mt. Albert Central 50. Remuera South *Lower-Upper Grade* 51. Epsom South 52. Howick 53. Hillsborough 54. Royal Oak. 55. Orakei 56. Remuera North 57. Meadowbank 58. St. Heliers 59. Glendowie *Upper-Upper Grade* 60. Mission Bay 61. Kohimarama.

Each division may then be mapped according to its grade, thus providing a distribution of social grades (Fig. 3).

CRITICISM AND COMPARISON

Perhaps the most important criticism which could be made of this method is that it does not analyse types of social stratification such as social class.[9] The grades are merely an indication of the comparative average occupational status and wealth (measured indirectly through the possession of amenities) of the people of a given area. However, provided that there were a sufficient number of high correlations between the distribution of Status-Possession grades and the distributions of other attributes of social grade, or of related variables, one could presume that the urban society under review was stratified and that each stratum was segregated residentially to a considerable degree. For

[9] A class, in the writer's view, is a relatively unified social group in which the individual working members are employed in occupations of a similar status and which provide a roughly similar income. It is a group whose members follow the same major patterns of behaviour and adhere to the same concepts. It implies a form of stratification which is relatively long established, but usually with no clearly marked boundaries (although in some cases boundaries may be very distinct, e.g. where the boundary is ethnic). Such a group has a common background and evolution.Thus, as a class is a complex of interrelated socio-economic, emotive and conceptual factors, most class analyses take into account both tangible and less obvious criteria. Of course, the status symbols, concepts and value systems which are often analysed in social class studies are not among the criteria on which the present index is based; nor could they be included in any study of such a large areal unit as a city unless only sample groups of the population were studied.

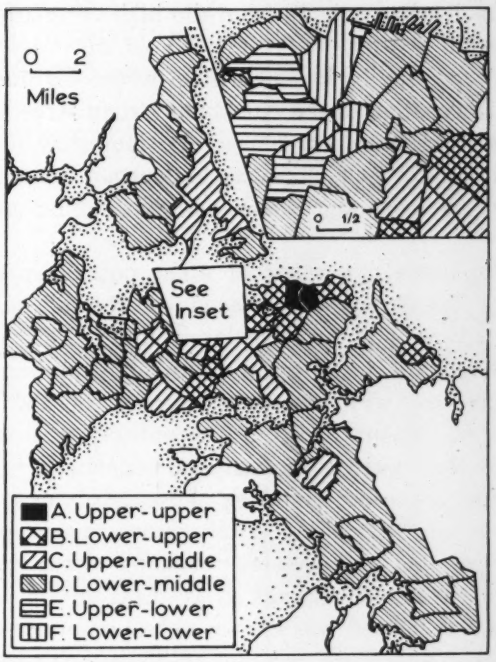

Fig. 3. Auckland Urban Area: Distribution of Social Grades.

Auckland the distribution of grades appears to approximate the distribution of the modal groups of the social strata found in a number of census divisions, but this is a highly subjective assessment which cannot be proved. It must be stressed, therefore, that at present the method analyses area, not social structure.

It is necessary to note briefly other major tested or presumed limitations of the index. First, it is crudely constructed.[10] Secondly, the index must be read as a comparative guide rather than a definitive statement on the grade of an area. That is, the positions of adjacent census divisions on the hierarchy may be interchangeable though probably the position of divisions further apart will not. Thirdly, breaks between grades are arbitrary so that divisions on either side of grade limits also may be interchangeable. Fourthly, the use of different variables may

[10] This is, in many ways, an asset because the index can be used for pilot surveys in which a simple, quickly-executed method is required. However, for more sophisticated requirements this is not an asset. Two improvements might be suggested:

(a) The employment of some system of tested weighting for variables included in the index. At present each variable is given an equal weight.

(b) The employment of some method by which stratification on the graphs may be tested quantitatively. This would be applied to both the graphs showing individual variables, and the final Status-Possession index graph.

give different results, but judging from the high correlation between the index and electoral returns the results would not vary too greatly.[11] Finally, correlations may be less significant where the number of census divisions is far lower than in the Auckland Urban Area. In other words the use of a method based on census divisions may have application only in the major New Zealand cities and urban areas elsewhere of a similar character and size, and where there is a similar areal breakdown of census data.

By testing the index a number of other possible criticisms can be answered. Some doubt may be placed on the adequacy of census divisions as relatively homogeneous areal units. This was put to the test by comparing the returns for the individual polling booths within each census division with the social grade of the whole census division. While no census division was entirely homogeneous, in all but a few cases they were sufficiently homogeneous for the purposes of the study. On the other hand in those few cases where relative homogeneity was absent polling booth returns provided a picture of the areal extent of the heterogeneous sections of the census divisions. concerned. For example, Parnell was ranked 26 on the index out of 61 ranks, yet Parnell was known to be composed of two strongly contrasting areas. There were two polling booths, one of which showed a strong Labour vote, the other a heavy National vote, and these booths were located in each of the contrasting areas.

A further factor tested by the study was the adequacy of census data. While census data are often not as discriminating as is desired, a case in point being the category *Labourers* discussed earlier, they are sufficiently discriminating, on the whole, to be employed in such a general study. A point in their favour is that they constitute the most universal sample available to the research worker.

Spearman's "Coefficient of Ranked Correlation" was employed because it is relatively simple to use. In a general survey of this type sophisticated methods are not necessary unless they increase the value of the study substantially, and this does not apply, it is felt, to the type of correlation employed. Judging from the Auckland survey, it appears to give adequate results.[12]

It might well be asked whether any consideration was made of the differences in age of development between census divisions of a similar grade. This was delimited by constructing a Demographic Index which employed a similar method, but, of course, population variables related directly to the era of development, not to social grade. They were the

[11] See below.

[12] Various students have used different formulae in order to correlate distribution patterns. One study in St. Louis employed Spearman's formula to correlate distributions; see Queen and Carpenter (1953):110.

"Ratio of Male Minors to Male Adults"[13], *Increase and Decrease of Population* and *Density of Population,* which this time intercorrelated significantly, as might be expected (Fig. 4).

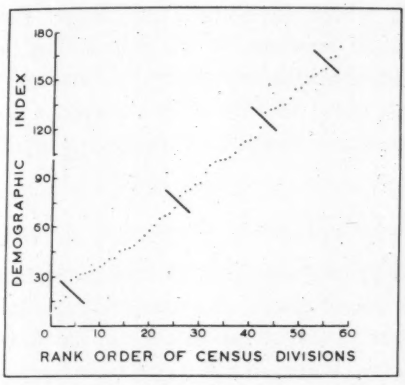

Fig. 4. Auckland Urban Area: Demographic Index.

Ranked order of census divisions: 1. Halsey-Waikowhai 2. Mt. Wellington 3. West Tamaki 4. Papakura 5. Avondale South 6. Hillsborough 7. Meadowbank 8. Glen Eden 9. Henderson 10. Manurewa 11. Rosebank 12. Takapuna 13. Sandringham (Mt. Roskill) 14. Howick 15. Glendowie 16. East Coast Bays 17. Birkenhead 18. New Lynn 19. Avondale North 20. Papatoetoe 21. Northcote 22. Kohimarama 23. Otahuhu. 24. Ellerslie 25. Waterview 26. Springfield-Owairaka 27. One Tree Hill 28. Mission Bay 29. Orakei 30. Remuera North 31. St. Heliers 32. Onehunga 33. Remuera South 34. Royal Oak 35. Mt. Albert Central 36. Sandringham (Mt. Albert) 37. Epsom North 38. Three Kings 39. Morningside 40. Pt. Chevalier 41. Epsom South 42. Devonport 43. Mt. Eden South 44. Westmere 45. Herne Bay 46. Mt. Eden Central 47. Parnell 48. Grey Lynn 49. Mt. Eden North 50. Ponsonby 51. Kingsland 52. Arch Hill 53. Eden Terrace 54. Freemans Bay 55. Newmarket 56. Newton 57. Auckland Central 58. Grafton.

Data for the parts of the three counties included within the urban area could not be obtained for two of the variables, thus 58 divisions only are included on the Demographic Index.

A graph was then prepared with the Demographic Index on one axis and the Status-Possession Index on the other. By plotting the point at which the two indices intersected, then delimiting significant clusters, census divisions of a similar grade but a different age could be segregated (Fig. 5).

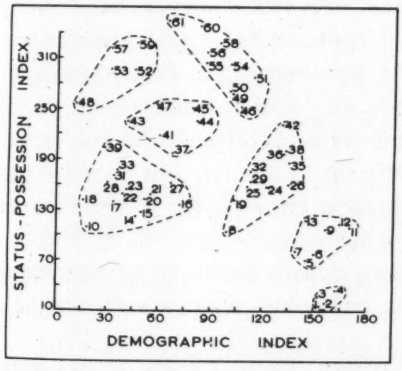

Fig. 5. Auckland Urban Area: Social Areas.

The reference number for each census division is the same as the rank occupied by the division on the Status-Possession Index Graph.

As the parts of the three counties were not included on the Demographic Index they were excluded also from this graph. On the Status-Possession Graph Waitemata County (Part) occupied rank 30, Franklin (Part) 34, and Manukau (Part) 40.

When testing a research method it is valuable to compare the method concerned with related methods employed in similar studies elsewhere. Related methods employing census data or other wide scale samples

[13] On the original graphs the Ratio of Male Minors to Male Adults was graphed separately from the Ratio of Female Minors to Female Adults. As the two variables correlated very significantly it was decided that one would be an adequate representative of age ratios.

appear to be few in number, as do studies on large urban areas.[14] Three studies employ or discuss a broadly similar method.[15] One other study uses census data in order to compare occupational stratification with residential location.[16] Otherwise studies on social stratification appear to be limited to the type of research which involves a prolonged and intimate association with relatively small sections of the population or with sample groups from which generalisations are made.[17] This technique is the first type described in an early section of the paper. Certainly few employ distribution as a primary method of analysing social grades.

RESULTS IN AUCKLAND AND USE

The resulting distribution of social grades was remarkably consistent with subjective notions regarding the social grade of areas in Auckland and where deviations occurred further research revealed the cause of such deviations. Furthermore, patterns were marked even in newly developing areas where differentiation is hard to assess subjectively because of the recency of most of the housing. The index merely quantifies obvious differences in inner areas, as in the case of the differences between, for example, Freeman's Bay and Remuera North. But in outer areas the index identifies marked differences between, for example, the East Coast Bays and Howick or Papatoetoe; differences which are only realised subjectively after a long residence in each place. This latter resultant differentiation is true also for inner areas which seem relatively similar on superficial investigation.[18]

The value of an index lies not merely in a result such as that briefly outlined above but also in its practical applications. Two examples can be given in which the use of the index was illustrated clearly. In order to determine whether there is a significant relationship between social grade and voting, polling booth returns were correlated with the index. As expected the correlation was significant. Similarly, this method has shown that there is a significant correlation between the distribution of Anglicans and social grade areas in Auckland.

Confronted with the necessity to seek causes for types of behaviour the social scientist must correlate one behaviour pattern with another.

[14] See Pfautz (1953); Moser (1958): 31; Barber (1957): Chapter 8; also references in this paper.

[15] Shevky and Williams (1949); Glass (1948); Shevky and Bell (1955).

[16] Duncan and Duncan (1957).

[17] e.g. Warner and Lunt (1949); Davis et al. (1949); Dollard (1949); Lynd (1929)

[18] Just before this article went to press the initial results were obtained from a survey of Wellington Urban Area that is being conducted by K. R. Fox and J. B. Palmer of Wellington Teachers' College. This survey employed the Status-Possession Index. The results, once again, were remarkably consistent with subjective notions on the social grade of areas in Wellington.

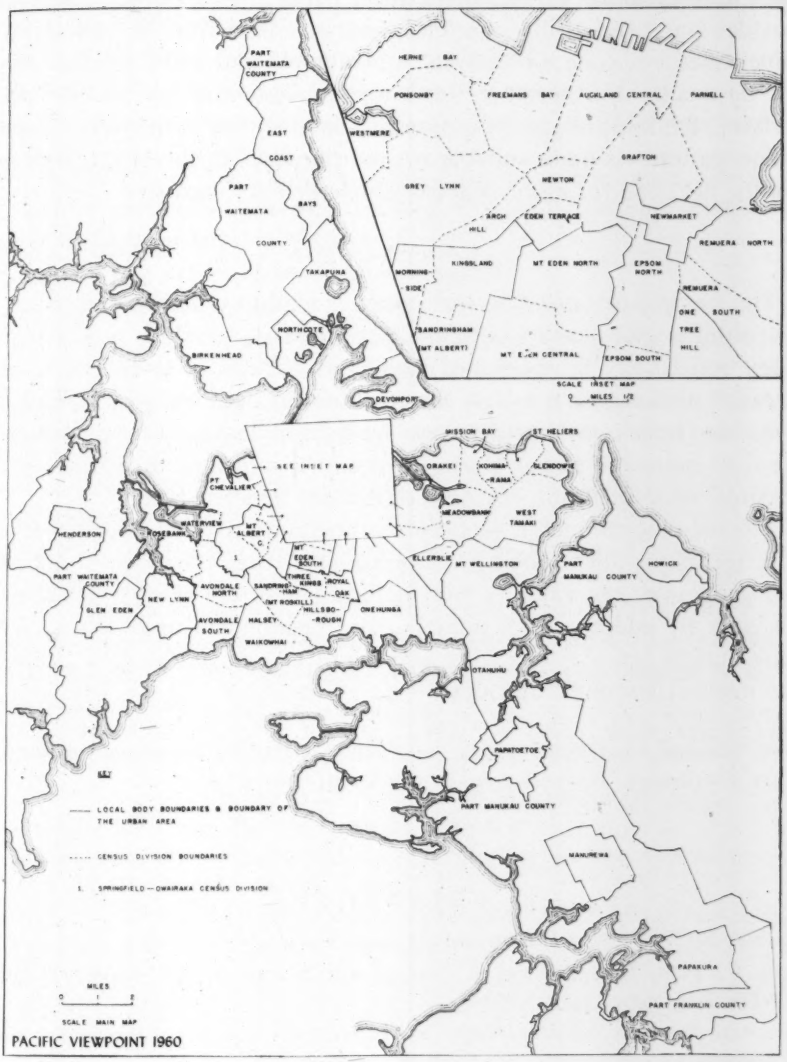

Fig. 6. Location.

The intercorrelation of the distribution patterns of modes of behaviour provides but a relatively unrefined analysis. However, in lieu of more refined methods such an analysis is invaluable and valid generalisations can be made. Furthermore, in some studies, such as polling booth analyses, the level of generalisation provided by the correlation of distribution patterns is quite suitable for the purposes of the study, thus precluding the need for more detailed supplementary studies.[19].

CONCLUSION

The method discussed in this paper is a simply-executed method for describing social grading within a large area. It provides a quantitative index which may be employed validly as a basis of comparison when research workers wish to test the relationship between social grade and some characteristics. Furthermore, by quantifying subjective notions on the distribution of social grades in a city it indicates the direction and possible value of future research of a more detailed type.[20]

For sociologists such a geographical method provides a readily applicable technique for studying relationships between behaviour patterns. For geography the value of this method lies in the results gained by it, for only by adding social grade to the phenomena analysed by urban geographers can overall reality and depth be achived in their studies of the internal structure of cities.

[19] cf. Wendling and Polk (1958), who compare the distribution of suicides with the distribution of social areas in two Californian cities.

[20] See Shevky and Bell (1952): 22.

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The Asian and Pacific Scene

AGRICULTURE AND SOCIAL CHANGE IN POST-WAR JAPAN

In Japan the land must produce to its utmost to support the ever increasing population and reduce the consequent drag on the economy imposed by food imports, which currently amount to one-fifth of the total imports.

The Land Reform of 1946 was a turning point in Japanese agriculture, which prior to that time had been burdened with the three major evils, tenancy, small holdings and fragmentation. Control was taken from the landlords, who for long had been mere landholders, and granted to the tillers of the soil who, as owner occupiers, were able to accumulate capital and, within the framework of their society and technology, cultivate the land as they chose. Despite the continuing small size of the holdings and despite fragmentation real progress in the post-Reform period was possible.

In contrast to most other writers who imply that the Occupation Authorities were the dominant force inducing reform, Masaru Kajita in "Land Reform in Japan" (Booklet 2 in the *Agricultural Developmental Series* (15 in all) published in 1959-60 by the Agriculture, Forestry and Fisheries Productivity Conference) contends that, although the Occupation Authorities contributed to the success of the movement, conditions were such that land reform was a natural development. He cites the growing frequency of tenancy disputes in the years between 1917 and 1945 as indicative of pressure for reform and claims that the legal restrictions on landlordism imposed during the war were an indispensable pre-condition to reform. The devastation of war, the high numbers of jobless people, the serious food shortage, the urgent need to reconstruct the Japanese economy and the need for harmonious relationships between government and farmer if agricultural produce was to be delivered at official prices, all tended to set the stage for land reform. Nevertheless the first Land Reform Bill favoured landlords, as it excluded from the provisions of the Act farms of up to five cho in area held by resident landowners. Most tenanted holdings were smaller than five cho and thus were not affected. In addition certain conditions were left to the discretion of Agricultural Land Commissions whose composition also favoured the landlords.

On the insistence of the Occupation Authorities a second Land Reform Bill was eventually passed after some revision and tenants were enabled to purchase land at low prices. Where tenants were well organised, as in the closely settled Kanto plain, land was liberated; but where landlords were strong redistribution favoured them. The area of tenanted land fell from 46 per cent of total agricultural area in 1945 to nine per cent in 1955. As Masaru Kajita states, "Farm land ownership has become virtually synonymous with management and for the first time in Japanese history peasants have become proprietors".

The social impact of this change has been profound; the semi-feudalistic land system has almost ceased to exist and rural society has been stabilised by the establishment of "middle standing" classes. This remodelling of the social and economic structure has broken the power of the old landlord village masters and enabled new leaders to emerge.

Tokuzo Tatsuno and Reiichi Kaneko writing in "Agricultural Extension Work in Japan" (Booklet 1) stress the urgent necessity for modernising Japanese agriculture through the introduction of advanced scientific techniques. Extension ser-

vices in Japan are now based on the pattern developed in the U.S.A. but, as in other countries with a large peasant population, their operation is difficult. There are for example complex regional variations in agriculture, and regional differences in technique and management. Furthermore in Japan the situation is aggravated by the social structure. Fukuo Ueno in "Land Utilization in Japan" (Booklet 12) clarifies this aspect of the problem. He stresses the part played by the village, pointing out that most agricultural settlements in Japan are not dispersed but are nucleated villages, each village forming a community. Management of the farm unit is an individual matter but many activities are communal; these include the use of pasture and forest lands, maintenance of roads and irrigation ditches, co-operative marketing and buying, and participation in worship and festivals. From some points of view these communal survivals are a barrier to individual change and initiative and the task of the farm advisor as a consequence is more difficult. However, the community can be of great assistance as it provides a workable unit for more ambitious schemes. The focal point is the village hall, a convenient and recognised meeting place for instruction, and if the community is won over great improvements can be made in a short time. Typical too is the school, a literate rural population can be more easily educated by the extension officers. Indicative of the high standard of living of the farmers in Japan is the presence of electricity in most rural areas, and radios provide another means for mass education. In 1958 there were a total of 10,626 farm advisors serving some six million farms. Well educated, well trained workers are the most important part of the service. Their task is to keep in touch with the latest research work and convey the findings to the farmers. Their guidance has been an important factor in the continued expansion of crop yields during the last decade; average rice, barley and wheat yields have increased by some 20 per cent.

The home advisors are faced with an even more difficult task. Matuyo Yamamoto in the "Home-Living Improvement Extension Service in Japan" (Booklet 4) outlines the social and economic conditions of rural society in Japan. She stresses that daily life "is sacrificed for the sake of guests, ceremonies and festivities and few are aware of the consequences". The greatest need is for the emancipation of rural womenfolk from a deeply rooted patriarchal feudalistic system. In most families the wife is still subservient to the husband and in addition is often subservient to the mother-in-law; as a consequence the family is frequently without a real homemaker.

It is paradoxical that although farmers are careful with the goods which they purchase they are often wasteful with the products of their own labour. Months may be spent gathering fuel, yet by simple improvement of the cooking stoves and pre-heating water with solar energy great savings can be made. Such a development would not only ease the burden of farm labour but would help to conserve fuel. At the present rate of consumption there will be no trees left in 17 years.

The task of the home advisers is immense but by initiating pilot schemes in selected *Buraku* (communities) some progress has been made. The chief limiting factor appears to be the inadequate numbers of trained workers. In the decade ended in 1959 the number of home advisers had increased from 68 to 1,689 but this is still far short of requirements as one advisor may cover 110 to 150 *Buraku* with 4,000 to 5,000 farm families. Close teamwork between home advisors and farm advisors does, however, help to offset this shortage and under their combined efforts the agrarian revolution in Japan is gaining momentum.

J. W. MACNAB.

CHINA: MEASURING A REVOLUTION

Western attitudes to the transformation of the Chinese economy over the past decade have shown that resistance to change and a stubborn refusal to modify one's world-view are by no means confined to grubbing and illiterate peasantries. It is true that many statesmen, scholars and newspaper editors are moving towards a gradual if grudging acceptance of the reality of the new world that is emerging in East Asia. Many, however, persist in the attitude of the Irishman confronted for the first time by a hippopotamus: "I don't believe it—it can't be true. . . ." Among a small minority such attitudes spring from a pathological anti-Communism or an outmoded racialism; among others from the tacit but quite unnecessary assumption that recognition of a reality involves approval of the means whereby that reality was achieved. This attitude has the unfortunate result that many recent analyses of the changes in China's geography since 1949—the period which has witnessed more profound changes in the cultural landscape than any preceding period—are superficial, often inaccurate and embarrassingly redolent with value-judgments.

In these circumstances the geographer who wishes to obtain a picture of the social and economic transformation of China—and of the new landscapes that are emerging—must look outside the field of geographical texts. Ping-chia Kuo's *China: New Age and New Outlook* (Penguin Books, London, 1960) provides a full and balanced picture of the roots of the Chinese revolution and of the economic and social changes of the last decade. S. Adler's *The Chinese Economy* (London, 1957) and T. J. Hughes' and D. E. T. Luard's *The Economic Development of Communist China* (Oxford, 1959) are narrower in their treatment but give a very full analysis of the economic achievements under the First Five Year Plan. The increased tempo of change during the last two years, the accelerating pace of economic expansion and the flexibility of Communist planning make it essential, however, to constantly revise one's picture in the light of the latest statistics. For these the geographer must turn to the various publications of the Foreign Languages Press, Peking. These include the popularly-slanted journals *China Reconstructs* and *China Pictorial* and the weekly *Peking Review*. The latter contains major policy speeches made by Chinese leaders, articles on developments in the economic and social life of the country, doctrinal dissertations (however turgid the phrasing these cannot be ignored since it is in them that the geographer can see most clearly the processes whereby a new society and a new landscape are being shaped in conformity with Marxist-Leninist teachings) and the communiques of the State Statistical Bureau on the progress of the national economy. Other publications include the *China Knowledge Series* which includes an unsatisfactory "Simple Geography of China" and solid studies of topics such as agricultural co-operation and the socialist transformation of the economy; the series of booklets *People's China in Pictures* ("Rural Electrification", "The Second Five-year Plan Fulfilled in Two Years", etc.); finally a statistical survey, prepared by the State Statistical Bureau, entitled *Ten Great Years: Statistics of the Economic and Cultural Achievements of the Peoples Republic of China* (1960).

These are State-sponsored publications and they immediately pose the old problem of propagandist statistics. Let it be said immediately that the method of presenting the data does little to reduce "consumer resistance" to the story they tell. There is a certain lack of subtlety in presenting five statistical tables, each titled "Great Victory of . . . " It is useful to have translations of editorials from the Chinese press which greet each stage of the "Great Leap Forward" though we may doubt whether a prose style calculated to stir the enthusiasm of the Chinese masses will convince the foreign reader as effectively as a more objective and restrained evaluation. Both style of text and visual material do, in fact,

suggest that much of the Chinese material available is designed first and foremost to meet the needs of a people only recently emerged from poverty and illiteracy and only secondarily to meet the needs of the overseas reader. And given the heady sense of achievement in China today this Sinocentric quality is likely to persist for some time.

Yet because the achievements of China's social and economic revolution are presented in an obviously propagandist fashion it would be folly to dismiss the basic statistics as mere propaganda. Charles Bettelheim, an expert on the economic problems of underdeveloped countries, has refuted this attitude in a valuable recent study ("The Revision of Chinese Statistics", *Monthly Review*, New York, March 1960, pp. 398-406). He points out that Soviet statistics were long treated with similar suspicion but that subsequent history has revealed that these so-called "propaganda documents" were, in fact, in strict accord with reality. And, he stresses, "In an economy committed to precise and detailed planning, in which statistics are intended not merely for study but constitute the instruments of action for tens of thousands of individuals, the invention of 'propaganda statistics' is virtually impossible" (p. 398). Errors will undoubtedly occur as in 1958 when the preliminary estimates of agricultural production were drastically revised some months later. The revision was necessitated, he suggests, by the inadequacy of the sampling from which crop yields were estimated and by heavy wastage in harvesting due to the physical difficulties of reaping and threshing such an exceptionally heavy crop at a time when a considerable sector of the rural population had been absorbed into industry. He comments: "If this is the case . . . there seems to be reason to believe that different methods of assessing harvests will be devised and that in the future agricultural statistics published at the end of a year will be sufficiently exact" (p. 401).

The fact that a country regarded by many pundits as "overpopulated" could experience a serious shortage of labour as China did in 1958 serves to draw attention to a critical problem facing all densely populated and underdeveloped countries—the rapidity with which the growth potential represented by rural underemployment can be exhausted. Further increases in production are then possible only if the productivity of labour is increased. This explains the continuing reassessment of the role of commune industry in the Chinese economy. It also explains the drive towards electrification and mechanisation in the countryside. "As a result a new and profound transformation of the Chinese countryside must be expected, and new resources of labour will be freed within the next few years for rapid industrialisation" (p. 406). The general pattern of such a development is set out in the publication *National Programme for Agricultural Development 1956-1967* (Foreign Languages Press, Peking, 1960). The increased tempo of mechanisation was foreshadowed by Mao Tse-tung in 1959 who "pointed out that following the switch-over to people's communes . . . 'the fundamental way out for agriculture lies in mechanisation', and 'counting from 1959, we should achieve a minor solution in four years, an intermediate solution in seven years, and a major solution in ten years' " (p. 46). The modernisation of Chinese agriculture is being characterised by the integration of mechanisation with garden-style farming, by rational planning of land use and by a widely-dispersed rural industry. The Chinese have set themselves the objective of "thoroughly changing the face of China's countryside" and of "constructing a new socialist countryside". Their success will have a major impact on the other countries of Asia who face the same problems; the processes and the measuring of this revolution are of challenging importance to geographers and all those concerned with "the agency of man on earth".

KEITH BUCHANAN.

NETHERLANDS NEW GUINEA: ECONOMIC DEVELOPMENT

The most isolated and underdeveloped territory in the former Netherlands East Indies was the western portion of New Guinea. The physical features of New Guinea bear some similarities to the islands to the west. Landforms range in type from the expansive swampy lowlands of the south to the snowcapped peaks of the Central Highlands. Temperature is largely related to the extreme changes in altitude; rainfall to altitude and location. In the south seasonal rainfall deficits are great enough to hinder the growth of secondary forest so that savannah areas are widespread. In the north the seasonal deficits are not great and thus virgin or second growth rain forest is usual in areas of lower altitude, giving way to grassland, mossy forests and alpine vegetation over 2,400 metres.

The cultural geography of Dutch New Guinea is entirely different from other areas in the former East Indies. The Papuans and Melanesians of New Guinea have a low standard of technology and socio-political units are small by comparison with the sultanates of the East Indies or even the chiefdoms in Polynesia. Normally the village, composed of a few extended families, and generally containing no more than 100 people, is the basic social unit. There is such a multiplicity of languages that most are spoken by no more than a few thousand people. Population densities are low when compared with those in the present Indonesia, although some highland valleys and some islands in Geelvink Bay are quite densely populated. Rice and other cereals were not grown traditionally, and even today the basic food crops are taro, yams and sweet potatoes, and sago which is the major food crop in the swamp areas. Pigs are kept mainly as a display of wealth and are eaten on festive occasions only. As they are virtually the only domestic animal there is often a protein deficiency in the diet which is overcome in part by fish and game.

Prior to World War II the Dutch, naturally enough, concentrated their energies on administering the more economically attractive portions of their East Indian empire. In 1946, however, a separate residency was established in New Guinea which permitted the growth of a comprehensive civil service, and in 1949 the institution of the Government of Netherlands New Guinea. Details of the present administrative machinery, and of New Guinea's history, geography and population are contained in the Annual Reports. (*Reports on Netherlands New Guinea for the years 1957 and 1958*, presented to the Secretary-General of the United Nations. Both Reports are in English.)

Since 1946 the civil service has aimed at improving the economic, social and cultural conditions of the Papuans. As a basis for social and cultural programmes subsistence farming must be improved. The utilisation of land is extremely extensive and more intensive farming methods are known only in the Central Highlands where sweet potatoes are grown. Research projects and extension services aim at demonstrating improved cropping methods, new crops, including those for export, and publicising dietary improvements. The most ambitious projects are the mechanised rice-cropping schemes at Merauke and Koembe in southern New Guinea.

Cash cropping by Papuans is recent and not widespread, the vast majority of the 700,000 Papuans living by subsistence cropping. Copra, unexpectedly for a Pacific territory, is an unimportant export. In 1957 5,025 tons were exported (cf. Australian New Guinea: 85,000 tons; Papua: 13,233 tons) valued at 2,194,000 guilders (10.5 Netherlands guilders = £(N.Z.)1), but this is an increase on the 1951-55 average annual export figure of 3,700 tons. Nutmeg and mace exports weighed 416 tons in 1957, a not exceptional figure. The exceptional value, however, of these spices in 1957, 2,771,000 guilders, was caused by the high market prices and has acted as an incentive to the replanting of improved varieties of

the trees. (*Handbook on Netherlands New Guinea*, Rotterdam, 1958, pp. 59 and 71.) The area under cocoa cultivation has been increased from 226 hectares in 1956 to 438 hectares in 1957. Up till 1958 there had been no exports of cocoa. Fermentation plants are under construction and loans are being offered to small farmers, some of whom are Europeans or Asians.

While it is most unusual to find European small farming in equatorial areas, the farms are few in number, and most of the cash cropping is in the hands of Papuans. Another unusual feature is the lack of plantations in Dutch New Guinea. This is not surprising when one considers the physical obstacles, plus the shortage of skilled and unskilled labour, and transport difficulties. However, the most significant factor operating against large scale investments in plantations in Dutch New Guinea probably was, prewar, the proximity of more favourable areas for plantation cropping in the East Indies. Incidentally, physical obstacles have not deterred plantation farming in eastern New Guinea.

The export income gained from overseas capital investments in plantations elsewhere in the Pacific is derived, in the case of Dutch New Guinea, from the exploitation of minerals. Oil prospecting, which was commenced in 1936, had cost the Netherlands New Guinea Petroleum Company some 385,000,000 guilders by December 1955. Production over the same period was valued at 101,800,000 guilders. In 1957 oil exports were valued at 20,831,000 guilders, or 71 per cent of the total exports (by value; 97 per cent by weight!). The Dutch are spending further large sums on exploration and development. Oil production occurs on the Vogelkop around Sorong and Steenkool. Sorong, the major oil centre, is a town of 12,940 people a large proportion of whom are housed in a special settlement built by the oil company.

Forestry and fishing are two other fields of development. Sawmilling has commenced at Manokwari where there is a mill with a capacity of 15,000 cubic yards per annum. This should meet domestic demands and allow an exportable surplus. Forests cover a vast area but "economic exploitation of the forests will only be possible in those areas where an adequate number of the more valuable tree species are found in close concentration and where transportation is not too costly". (H. G. Verhoef, *Netherlands New Guinea*, The Hague, 1958, pp. 39-40.) Forests are important to the indigenous people as areas where game may be hunted, food gathered and timber cut, and usually are accorded some place in the traditional land tenure systems of indigenous groups. Furthermore copal, the gum of the agathis tree, is gathered and exported in small quantities. The importance of forests has been recognised and conservation and reafforestation schemes are occurring, such as the project at the Sentani Lakes, near Hollandia the capital. The fishing industry is limited at present to some commercial fishing, plus research and advisory programmes. A recently developed industry is crocodile hunting. Markets for skins are highly capricious but exports have increased over the last few years and in 1957 the export of skins brought in 1,782,900 guilders. Crocodile skins were the fourth export that year by value and second by weight.

This brief survey should indicate some of the fields of economic development in Dutch New Guinea. The Netherlands is faced with the problem of administering an enormous, backward territory, but she is able now to devote fuller attention to this, the remaining portion of her pre-war East Indian empire. In fact the symbolic importance of Western New Guinea in international politics ensures that the Dutch cannot allow any openings for criticism of their administration. Therefore the Dutch are pursuing a policy of economic and political development in accordance with the United Nations Charter, but in the face of tremendous physical and cultural obstacles. So great are these obstacles that it has been said

that: "The Dutch task of raising the economic and political standards of the native people seems to be both formidable and unrewarding" ("Australia and New Guinea", *The Round Table*, No. 195, June 1959, London, p. 245).

It is obvious that political and social advancement is impossible without adequate economic development and *vice versa*. Thus economic development is of extreme importance. In the economic field the task for the future seems to be diversification of the economy in order to overcome the present dependence on oil, and an increase of Papuan participation in the export trade.

IAN POOL.

ELIZABETH: A NEW AUSTRALIAN TOWN

Since the end of the 1939-45 war the total population of the State of South Australia has increased rapidly. Although the increase in total population is a characteristic of the Commonwealth as a whole, it is particularly noteworthy in South Australia because the percentage increase is well ahead of the national average. Between the censal years 1947-1954 the total population of the State increased by 23.5 per cent (646,073 to 797,094), whereas that of the Commonwealth increased by only 18.5 per cent (G. H. Lawton, "The Growth and Distribution of Population", in *Introducing South Australia*, Adelaide, 1958, pp. 37-47). Of the 151,021 gained by the State during these years, 100,094 (66 per cent) were absorbed by Adelaide, so that by 1954 Adelaide's population reached 483,508, i.e. 60.7 per cent of the total population of the State then lived in the capital city. With the exception of Melbourne, where the metropolitan percentage was a little higher, this represented the highest proportion amongst the State capitals. Between 1947 and 1954 the percentage increase in the metropolitan population (26.4 per cent) was considerably higher than the State percentage increase. In other words Adelaide was gaining population faster than the State.

Growing larger at this rapid rate has been so far a relatively painless affair for Adelaide. But now, because further expansion of the triangular site of the city is severely restricted, the position is serious. Development to the west, south, and east is limited by the physical barrier of the sea and the economic barrier posed by a steep scarp, while the holding paddocks of the abattoirs and the land associated with Parafield aerodrome present obstacles difficult to overcome in any attempt to extend building to the north. These limitations, made critical because of the scarcity within Adelaide proper of new land available for building, were appreciated by the South Australian Housing Trust in 1949, and after careful consideration of both the existing position and the future pattern it was decided to create a new centre to absorb much of the growing population rather than to extend the present site.

The new town Elizabeth is situated some seventeen miles north of Adelaide. Two main factors influenced the actual choice of the site, namely the presence nearby of an established industrial area and the relative proximity to Port Adelaide (A. M. Ramsay, "Factors Affecting the Siting and Design of Elizabeth", *Proceedings of Royal Geographical Society, South Australian Branch*, 1956, Vol. 57, pp. 5-14). Residents were thus provided with a source of employment during the early period of the development of Elizabeth, while ease of access to the State's main port supplied an attractive incentive to companies interested in the subsequent development of new industries. Other important considerations included the availability of electricity, communications and water—the latter so essential in a State where only four per cent of the territory receives an average annual rainfall in excess of twenty inches.

The project, which commenced in 1954, consists of building a major town in open country. The new town is planned to develop not into a dormitory suburb or even a satellite town, but as a complete settlement within its own right and dependent on no other centre. As the area selected was without any previous settlement the authorities have been able to follow many overseas trends in the overall plan of Elizabeth. Three features deserve special mention. The shopping centres have been designed for the convenience of pedestrian shopping and shopkeepers. Thus the shops face covered walkways and open spaces from which vehicular traffic is excluded. The town has been developed for the motor car age; a ring road collects the incoming traffic and distributes it quickly to the various car parks. Electricity services have been distributed underground. The general improvement in the appearance of the overall street picture as the result of the absence of overhead wiring and massive poles is so marked that it vindicates the decision despite the cost involved.

The basic element is the neighbourhood unit. This is grouped around its own sub-centre of shops, school, churches, halls, etc. and separated from through roads, though adequately linked with them. Ten such units, each with a population of between 4,500 and 6,000, will eventually be arranged about the main town centres. Already construction is under way in seven of the neighbourhood units and at the end of March 1960, 15,511 people had settled in 3,989 houses. Thus Elizabeth, with less than six years' growth, had become the largest centre of population in South Australia outside of Adelaide.

Conscious of the necessity to offset the relatively uninteresting site of Elizabeth, the planners are paying particular attention to the road pattern, the introduction of verticality, and the arrangement of open spaces. Whereas through traffic uses long and straight streets, movement within residential areas is along streets of an intimate style designed to present variety as well as foster compactness and discourage speeding. In order to overcome the lack of height in the general picture, civic buildings are being sited on any available high ground and trees are being planted at every opportunity. With regard to open spaces a generous provision of 1,400 acres (20 per cent of the site) has been made and is well in keeping with the coveted South Australian tradition which is symbolised by the "green belt" of parklands surrounding Adelaide.

Industry has been allocated three sites (outside and distinct from the residential areas) clearly indicating that industry has become a vital part of the economy of South Australia. The rapid industrial development of the State is well known. Since 1939 the number of factories has increased by 97 per cent, employment by 112 per cent and the value of factory production by 800 per cent—from £(A.)14 million to £(A.)126 million. (South Australian Government Publicity and Tourist Bureau, *South Australia—Achievements and Resources,* Adelaide, 1959.) Several new projects, involving an investment of approximately £(A.) 60 million, have recently been announced and it is gratifying to see that some of this capital will be devoted to an expansion of the automobile industry on a 290 acre site at Elizabeth. The establishment of industries by private enterprise is always difficult to predict, but the planners of Elizabeth do not anticipate any embarrasment over the large acreage of land set aside for industrial development. The State is renowned for its industrial stability and this, plus the several factors of site, are confidently expected to encourage interstate and overseas companies. Already many plans for the commencement of operations have been publicly announced.

It is hoped that by 1968 Elizabeth will be a well-balanced city of some 50,000 people. Although there has been a maximum amount of planning, variety has been sought (approximately fifty types of houses have so far been built) rather

than standardisation, and regimentation has been avoided. The South Australian Housing Trust, often cited as a model housing authority, intends by keen insight and broad outlook to retain that honour and is thus striving to make Elizabeth a classic. Whatever the outcome, this experiment will be closely watched by planning authorities throughout the continent of Australia.

BRYAN SAUNDERS.

FIJI: BLUEPRINT FOR DEVELOPMENT

Fiji provides a classical example of the major problem facing the South Pacific territories today: that of matching the pace of economic development with population increase. In the decade 1946-56 the average annual increase of population was 2.91 per cent. Over the period 1936-58 the volume of agricultural production (excluding sugar) has remained almost static. Only a six-fold increase in the prices of agricultural exports and a 40 per cent increase in sugar production has enabled the average annual income in Fiji to maintain itself at about £(F.)70 per head. Increased Westernisation since World War II has led to a steady expansion in the needs of both the Fijian and Indian communities; this expansion has not been matched by an advance in the capacity to satisfy these wants. It was in view of disquieting economic considerations such as these, complicated and highlighted by the marked cultural cleavage between Indian and Fijian communities, and the steadily mounting numerical preponderance of the Indians, that the Fijian Government in 1958 appointed a commission to investigate the problems and to make recommendations to Government as to the future development of the Colony.

The Report (*Report of the Commission of Enquiry into the Natural Resources and Population Trends of the Colony of Fiji, 1959*, Council Paper, No. 1 of 1960 of the Legislative Council of Fiji, Crown Agents for Overseas Governments and Administrations, London) shows no illusions as to the magnitude of the task facing Fiji. In simple economic terms, even the maintenance of the prevailing modest standard of living means that the national income will have to grow at the rate of three and a half per cent per annum. Translated into terms of action, this can only be achieved by major changes stemming from the execution of a comprehensive, well-integrated plan. In general, the Burns' Commission has succeeded splendidly in its task of conceiving the broad outlines of such a plan, and many of its recommendations will, if adopted, have far-reaching repercussions. While all sections of the population will be affected, it is clear that the Fijian community will have to accept the most significant changes.

One of the most controversial recommendations is that birth control should be actively promoted by the Government. Additional family planning clinics should be provided and free contraceptives made available to married persons. While birth control methods will merely act as a palliative to the population problem (in terms of the current rate of increase the 1959 population of 374,284 will reach 691,000 by 1980), it must be realised that rather less can be expected from the effects of industrialisation in view of the Colony's narrow resource base, lack of capital, unknown potentialities for power, and the small size of the local market.

Fiji's most important resource is the land. The recent soil survey indicates that a rather larger area of land is available for utilisation than had hitherto been envisaged: 29.87 per cent of the total area is suited to agriculture with little improvement necessary; after major improvements a further 31.93 per cent could be used. These figures are greatly in excess of the estimated total of 415,593 acres used for cropping or improved pasture in 1958. During the past decade the area

under cultivation has increased by only 11 per cent in comparison with a total poputon increase of 30 per cent. What at first seems to be a desirable trend towards an intensification (the overall population density is only 54 per square mile) has led instead to the retention of a cane monoculture, accompanied by soil mining, a decline in per capita production and a labour surplus in some areas. Not only must agricultural practices improve, but a more dispersed distribution of settlement and a more mobile labour force are needed. Thus there is a great need to open up much of the unused land to new systems of land use—a development that involves a great expansion in the road construction programme, and a liberation of some of the land from the clan groups in which it is at present locked up.

Development of accessible land requires capital. In addition to recommending that the clan, as the land-owning unit, should be able to pledge its land as security for a loan, the Commission proposes that extra finance be made available to the Agricultural and Industrial Loans Board and that the cost of items such as fertilisers and fencing wire should be subsidised by government for a ten year period.

Greater obstacles to land development lie in the disincentives existing in the Fijian land tenure system. The Commission has rightly honoured the 1874 Deed of Cession in reaffirming the Fijian's right to the ownership of the land (83.6 per cent. of the area of the Colony) and recommends that the method of holding the land be completely preserved. This conservatism may not prove to be altogether wise in view of the many shortcomings of the *mataqali* (clan) system, noteworthy amongst which are the frequent gross disparities between the number of people in a clan and the amount of land available to them. The writer supports Professor Spate's alternative which recommends the vesting of land in the village until Fijian society becomes a community of independent farmers. (*The Fijian People—Economic Problems and Prospects*, Council Paper No. 13 of 1959 of the Legislative Council of Fiji, Suva, p. 15.) In fact, the Commission endorses Spate's objective of individualism, noting that the Fijian independent farmer (who is exempted from communal obligation by a fixed annual payment) does just as well, if not slightly better than, his Indian counterpart. The Commission believes that were it not for the sanctions provided by the Fijian Affairs Regulations, the communal system would not long survive.

The position of the independent Fijian farmer in society would be immensely improved if the Fijian Administration is progressively abolished, as recommended. The Colony is unusual in having a "dual administrative system" for the Fijian Administration, with its jurisdiction over native Fijians in the Colony, operates as an autonomous administrative machine divorced from the Central Government. The Commission's recommendation is based on the belief that the Fijian Administration is no longer effective as a local government organisation, that it "tends to isolate the Fijians from all other communities", and continues "to foster an outdated communal system against the wishes of a large number of people who desire a much greater degree of freedom". It is clear that even the "felt needs" of the Fijian people demonstrate their committal to Western values and goods; what is more, the necessity that they should compete on equal terms economically and politically with the Indians requires accelerated social change. The policies of the Fijian Administration serve mainly to protect the Fijian from the sharp edge of Indian economic competition, but it is absolutely imperative that he face this competition if he is ever to hold his own and contribute his share in the development of the economy. The Commssion proposes that local Government should be set up as soon as possible in selected areas and then gradually extended; at the same time the local Fijian Administration should cease to operate. If a harmonious multi-racial society is to emerge and attain self-government, it is clear

that such developments are to be welcomed, for they will prepare *all* Fijians for the future by enabling them to work together and gain experience in governing themselves.

The Indian desire for land should be partly satisfied if the various recommendations making for greater security of tenure are adopted. In particular it is thought that agricultural leases should be for a period of sixty years, or ninety-nine years if tree crops are to be planted. While serious doubt is thrown on the wisdom of reserving land for the future use of Fijians, the Commission strongly urges the acceleration of final demarcation of reserve land. The Commission considers that all owners of land should be taxed heavily for failure to use adequately any land that is capable of use—a recommendation that strikes directly at idle European planters as well as Fijian owners. These proposals could do much to set in train an agricultural revolution in the Fijian countryside and wean many Fijians away from dependence on an indigenous crop that has brought in ready money with a minimum of effort and little reorientation of agricultural outlook. The position has been described aptly: "My coconuts say to me 'If you take care of us for four years, we will take care of you for four generations'."

In general, the Commission stresses a reorientation towards a more mixed type of agriculture—both in terms of diversification of crops and the introduction of livestock. In particular, it is important that Indians at present obsessed with cane grow this crop only as an integral part of a mixed farming system. A vastly expanded coconut replanting scheme, improved cattle breeding and dairy farming (rather than the current ranching) are also called for. Since forestry also holds promise for the future, it is recommended that 100,000 acres be made available for a productive forest estate. Agriculture received only 2.57 per cent of the Colony's budget in 1958, so that a prerequisite for the success of most of the recommendations is a substantial increase in the Department's grossly inadequate share. It is to be hoped too that the many suggested changes in cropping systems are not allowed to lapse and thus escape the fate of so many earlier recommendations of visiting agronomists.

While one may cavil at certain recommendations, there can be no doubt that the Report as a whole is an outstanding document. Not only does it set forth an impartial and well-balanced assessment of Fiji's many-faceted problem, but it also sketches, with a bold hand, the main lines of a blueprint for future development. It is to be hoped that virtually all major recommendations will be adopted by the Government, even though this will mean finding finance of the order of £13 million sterling over the next decade to close the gap between the resources available and those required, and at the same time, it is hoped, fashion a viable economy in which growth should be self perpetuating. Above all, it is vital that the recommendations of the Report are not judged in isolation and adopted in piecemeal fashion, for that might so limit the effect of making major changes in various interdependent components of the economy as to deprive the growth processes of much of their momentum. Moreover, it must not be forgotten that the policy of the Burns' Commission, even if adopted in its entirety, will have to operate in the institutional environment of Fiji; its ultimate success may well depend on the extent to which it can help to refashion that environment. For this reason, the greatest changes must affect the Fijian community more than the Indian. The problem indeed is not one of reactivating a moribund economy but of refashioning it so that it can function in a way it was never designed to do in its original setting. If this is not done, the Fijian institutional structure may continue to insulate society effectively from the influence of economic forces and so retard change.

R. F. WATTERS.

TSUNAMIS IN THE PACIFIC

The properties of tsunamis are fairly well known in some respects although much remains to be learnt. Tsunamis can be generated by underwater volcanic activity and by mud slides, often triggered by earthquakes, occurring on the edge of a continental shelf. Seismic motions of the sea bed are the most common source, but little is known about the mechanism of generation, because the seismic movements involved are not usually known. An impulsive shock which imparts energy of motion (kinetic energy) to the sea can cause tsunamis just as effectively as a more gentle motion which deforms the sea surface, thereby creating a local excess or deficit of potential energy. In either case the initial energy will cause surface oscillations, and energy will be radiated out in a train of waves.

In any wave motion the energy is shared approximately equally between kinetic and potential energy, and therefore the tsunami will manifest itself as an oscillating current (horizontal, and extending from sea surface to bottom) as well as a deformation of the surface. The maximum current speed developed in the open sea is $(va)/h$ where v is the wave crest speed, h the sea depth and a the wave height above mean sea level, all given in compatible units. The wave crest speed, which is given by the formula $v = \sqrt{gh}$ (g is the acceleration of gravity), may be several hundreds of miles per hour in the deep ocean. The interval of time between the passage of successive crests in a tsunami wave train past a given point in the open ocean will be approximately constant for a given tsunami, usually lying in the range 500 to 5,000 seconds.

The interaction of a tsunami with a shore is complex. One reason is that the variability of wave speed results in refraction which may cause local concentrations of wave energy. Coasts which have no continental shelf are the most vulnerable to damage from tsunamis approaching from a distance. Hawaii and parts of Japan suffer frequent damage because tsunamis approaching from the deep ocean, unimpeded by a shelf, tend to run up the steeply sloping sea floor on to land. A shelf adjacent to land usually protects the coast. Some of the tsunami wave energy is reflected at the shelf edge, and bottom friction operates more effectively in the shelf waters than in deep waters. On the other hand there are processes which may augment wave height. The waves transmitted over the shelf travel more slowly and are therefore bunched more closely together. This bunching tends to increase wave heights. Secondly, an oscillatory motion of the shelf waters may be set up in which the sea level oscillation is greatest near to the shore and least at the shelf edge. The time for each cycle of oscillation (period) will equal $(4L)/(\sqrt{gh})$ where L is the distance from the shore to the shelf edge and h is a mean depth. The same kind of motion also occurs in bays and harbours. The name tsunami comes from the Japanese for harbour waves.

In the Pacific, tsunamis usually originate somewhere in the seismic belt which practically surrounds the ocean. Broadly speaking this belt lies along the coasts of South America, Mexico, California and Alaska, continuing through the Aleutian Island arc across to the Kamchatka coast through the Kurile Islands, Japan, the Philippines, Indonesia, New Guinea, Solomon Islands and New Zealand. Many tsunamis originate from seismic activity in the deep trenches, notably the Kurile and Aleutian trenches and the Mariana trench.

Reference may be made to some of the more noteworthy tsunamis which have occurred in the Pacific. Darwin, in his *Journal of Researches*, gives a good account of the disaster at Concepcion (Chile) on 20th February 1835. Arriving in the *Beagle* a fortnight after the earthquake, he found the scene aweful, but at the same time of the deepest interest. The most damaging of the many tsunamis which have struck Hawaii destroyed much of the waterfront at Hilo on 1st April 1946.

This tsunami originated south of the Aleutian Islands. Huge waves from the same tsunami destroyed a lighthouse sited 100 feet above the sea at Dutch Gap in the Aleutians. As a result of this tsunami a warning system was set up in the north Pacific.

The warning system proved its worth following the Kamchatka earthquake of 4th November 1952. Although the resulting tsunami did not produce huge waves on nearby shores as in the 1946 tsunami, many distant gauges recorded waves bigger than those recorded for the 1946 tsunami. The largest wave recorded on the American coasts was apparently at Talcahuano (Chile) where a maximum rise of twelve feet was recorded. This would no doubt be due to local effects as many gauges much closer to the earthquake recorded much smaller waves.

New Zealand has not been struck disastrously during the last century. Tsunamis originating near South America have been more pronounced in their effects than the smaller locally generated tsunamis. The Peruvian earthquake of 13th August 1868 caused strong oscillations in Lyttelton harbour, and the Iquique (Chile) earthquake of 1877 caused considerable damage on the Chatham Islands. The recent Chilean tsunami (May 1960) caused strong surges on the New Zealand coast, but the presence of a shelf prevented the tsunami from causing as much damage as it did in more distant Japan.

A. E. GILMOUR

Geographical Reviews

COSMOLOGY AND CONFUCIANISM

Joseph Needham with the collaboration of Wang Ling, *Science and Civilisation in China,* Volume III, "Mathematics and the Sciences of the Heaven and the Earth", Cambridge University Press, Cambridge, England, 1959, pp. xlvii, 876, Illus., Bibliogs., Index, Table of Dynasties, $22.50.

The third volume of Joseph Needham's seven volume study of the scientific aspects of Chinese civilisation produces the first paying ore so far, because, as Needham puts it, the first two volumes dug the shafts, tunnels, adits, and prepared the explanations and interpretations. Volume Three must be seen as one of a series, but it can be examined for what it alone does contribute. "The purpose of this volume is to elucidate the contributions of traditional Chinese civilisation to mathematics and to the sciences of the heavens and the earth—astronomy and meteorology above, geography and geology below" (p. xli).

To all geographers interested in the comparative knowledge and technological accomplishments dealing with the surface of the earth this is the most significant volume of the series. The specific subjects here treated are: meteorology, geography and cartography, geology and palaeontology, seismology, mineralogy, astronomy and mathematics. The 220 pages devoted to the earth sciences constitute by far the best historical summary of traditional Chinese activities in these fields available in an occidental language. Later volumes will discuss other subjects of interest to geographers.

Close to 100 pages are devoted to geography and cartography. Though a popular rural village tradition of a flat earth remained current, from a very early date scholars thought in terms of a round earth. When it came to cartography, the practical issues to be solved in a large region resulted in a quantitative rectangular grid, derived very early, but best laid out by Chang Heng at the com-

mencement of the Christian era. Maps were drawn on silk cloth, the alignment of the warp and woof perhaps suggesting the grid concept. Such a map could be extended laterally to cover as much territory as desired. By the eighth century a map of much of Asia had been compiled on separate sheets on a basic scale of perhaps 1:2 million (one inch to 100 li is not, as stated by Needham, 1:1 million), which assembled to a dimension of about thirty by thirty-three feet. In the eighth century astronomical reference points were tentatively tied into the rectangular grid, and something approaching the Mercator projection finally resulted.

Relief maps first moulded in wax or sawdust-paste media were copied for permanence in carved wood in the eleventh century. Needham illustrates a primitive contour-concept map of Tai Shan from the fourth century. The Chinese never did better with sailing charts than did the early Mediterranean cartographers; but on land their use of the basic Babylonian instruments, the water level, the sighting board, and the graduated rod, augmented by the Jacob's staff (developed in China from the Chinese crossbow or arbalest), and the compass, permitted them to do much better than did Europe at an early date. The Chinese early carved maps on stone, from which reproductions by rubbings could be taken at liberty, but the first true "printed map" is a Chinese map of A.D. 1155.

Needham believes that Babylonian-Mediterranean ideas reached China extremely early, were developed locally, and were steadily extended by Chinese geographers during the second to tenth centuries without becoming submerged under a religious cosmography such as overtook the Ptolemaic geographers in the early European world. He suggests that the Arabs might have learned considerably from the Chinese, and he wonders if the first Arab grid maps were purely a resurrection of the Ptolemaic tradition alone, or whether the stimulus may not have come in part, at least, from the active tradition of cartography in China, since the Arabs were in contact with the Chinese world both by land and by sea. A surprising paragraph next suggests the reappearance of the old Chinese rectangular grid on occidental military maps during World War I. Needham does not fully explore this subject of a flow to the Arab-Europe "worlds" of Chinese geography-cartography, and here is a fascinating field waiting full exploration by the historical cartographer.

The Chinese produced several kinds of "geographies" from a very early date. What Needham terms Anthropological Geographies, Descriptions of Southern Regions, and Descriptions of Far Countries all form a kind of regional geography similar to that we know from the Arabs. There are, of course, dozens of great Travel Geographies in Chinese beyond the few that have been translated. There are many Hydrographic Geographies, but the Coastal Geographies are fewer and chiefly later. It is in the Local Topographies which Needham suggests number well over 8,000 separate regional compilations that Chinese geography far exceeded the achievements of the European world; these begin with the Christian Era, and multiply rapidly in later centuries. Geographical Encyclopedias are very numerous also, starting about the third century.

About 30 pages are devoted to meteorology. Though the Chinese were much concerned with rain magic and atmospheric phenomena as related to divination, they had recognised the fundamental principle of the "water cycle", and the role of mountains in the precipitation cycle, by the fourth century B.C. They adopted the Babylonian rain gauge, developed out of it a snow gauge, perfected a hygrometer, and formulated the mechanics of a region-wide recording system, all of which are sometimes today ascribed to Korean invention. With one of the great tidal bores on their coast (Hangchow Bay south of modern Shanghai), the Chinese studied tides far more intensively than did the Mediterranean-

European peoples, and by the first century A.D. had worked out the essential effects of the moon on ocean tides.

Needham explains his short sections on geology, about 30 pages, on seismology, 11 pages, and on mineralogy, 44 pages, as due to the lack of comprehensive historical literature in any language on which to build. He devotes more space to mineralogy than to the other two because the Chinese literature on mineral medicines is more extensive. The Chinese recognised the essentials of uplift of marine strata, and the basic principles of sub-aerial erosion, centuries before the western world had escaped the bounds of religious cosmographic controls. Modern seismologists have long recognised their debt to the Chinese for the development of the seismograph, an operative instrument by the second century A.D.

About 300 pages are devoted to astronomy and to related subjects. Chinese concepts in the field appear derived from the earliest Babylonian, but since the Chinese lived in a different portion of a spherical earth, they evolved a polar-equatorial, algebraic astronomy unlike the geometrically built ecliptical astronomy evolved by the Greeks. The first European astronomers to reach China entirely misconceived the basic ideas of a science of astronomy in decline and almost finished it off, just after European astronomy had started its evolution out of the inadequate Greek concept in one of the great advances of the Renaissance. Needham comments at length on the very mixed blessings resulting from the coming to China of Jesuit astronomer-scientists belonging to an "old school" that was rapidly passing in Europe.

Chinese star charts are the oldest extant, but the Chinese "saw" constellations quite differently than did the western world. Though sixteenth and seventeenth century European instrument-making was well in advance of the Chinese technology, Chinese armillary power provision approximated the clock drive of the modern telescope, and the Chinese concept of the universe, with stars floating in infinitely empty space, was well in advance of the solid-sphere world picture then held in the western world.

The first 170 pages of Volume Three deal with mathematics. Whether China ever was well exposed to the earliest of Babylonian mathematics is uncertain, but it is clear that the Chinese chose different concepts on which to build at a very early point. Chinese mathematics remained essentially practical and, if this did not lead them, early, to the really higher mathematics attained in the modern occidental world, it contributed to world mathematics in the long run. The Chinese circle was divided into 365¼ degrees, unlike the Babylonian sexagesimal concept inherited by the Greek world; fractions were handled differently than in Greece, and earliest China evolved a system of numerical notation using nine figures, a blank space, and a place-value concept. India eventually drew the line of the zero around the Chinese blank space in the series. Though the Chinese were acquainted with geometry, they chose to work through algebra, the reverse of the Greek pattern. Needham concludes that between 250 B.C. and A.D. 1250 much more mathematics came out of China than went in, but that after about 1250 the Chinese failed to improve upon their forbears.

Reflecting on the history of science, in which Needham constantly compares Chinese with Arab, Indian, or Occidental achievements, one of his chief concerns is the origin of and diffusion of elements of science between "culture worlds" (my term). He notes, and ponders, but offers no full explanation of the occasional long time-lags that relate to the spread of certain features, as opposed to the extremely rapid diffusion of other aspects of science. Useful ends can be achieved through different means; in many fields the Chinese were quite selective of ideas they received from other regional centres of development. Clearly, diffusion of scientific ideas moved in all directions; and though it is proper to speak of

several "culture worlds" in terms of centres of development at particular periods of time, it is obvious that if one takes the really long time view there was just one large "culture world", with basic human learning being exchanged between varied local sectors at different times for shorter periods of further development and secondary inventiveness in significant directions. In this respect China was an active sector of the traditional Euro-Asiatic "culture world".

Implicitly in Volume Three is a point of view repeatedly expressed in Volume Two, namely that: "On one side Confucianism was basically rationalistic and opposed to any superstitious or even supernatural forms of religion. But on the other side its intense concentration of interest upon human social life to the exclusion of non-human phenomena negatived all investigation of Things, as opposed to Affairs" (Volume II, p. 12). Needham feels that the restrictions upon the investigation of Things in the end controlled the lengths to which Chinese science would develop. Starting with the wide ranging ideas of the most ancient world in the second millenium B.C. China progressed steadily until about A.D. 1250-1400, at which time tight Confucian bureaucratic control over the concern for Things stopped the upward trend. I would agree that there were no true "breaks", such as the Dark Ages of Europe, in the upward trend to about 1400, but would also add that some of earlier dynastic interims should certainly be conceived as constituting periods of quiescence. Needham's study does not consider periods after about 1700, so that no final opinion is, throughout Volume Three, expressed about modern China, though a tentative conclusion is reached in China-Europe comparison that: "Apparently a mercantile culture alone was able to do what agrarian bureaucratic civilisation could not . . . bring to fusion point the formally separated disciplines of mathematics and nature-knowledge" (Volume III, p. 168).

Reflecting further, there is a point on which Needham remarks only occasionally, that has regional application. This is the distinction between beliefs, knowledge, and technology of common people, as opposed to those of the scholar-scientists. The advancements made by science in any region at any time can be forgotten, lost, "buried", or stultified through "controls". The outsider may reach a mistaken conclusion quite easily by securing inaccurate information from the wrong source, as when Ricci in 1595 seriously wrote home to Europe that the Chinese believed the sun hid under a mountain near the earth during the night, an idea to be derived only from a Chinese totally ignorant of even sixteenth century Chinese astronomy. There is constant danger of understating achievement in the above manner, but there is equal danger in doing just the opposite—overstating the case by ascribing to a society (either the historic or the contemporary) concepts, accomplishments, or conditions held by, achieved by, or applicable to, only a narrow segment of the whole society. For China the historic and the contemporary literatures are replete with examples of both.

J. E. SPENCER.

GEOGRAPHY OF A PRIVATE ESTATE

Pradyumna P. Karan with the collaboration of William M. Jenkins, *Nepal: A Cultural and Physical Geography*, University of Kentucky Press, Lexington, 1960, pp. 101, $10.

A mere ten years ago it would have been impossible to produce a geography of Nepal that could even lay just claim to such a title. Since the pioneer journeyings of Sir Joseph Hooker in Eastern Nepal over a hundred years ago, no European had been permitted to penetrate the Kingdom of Nepal other than

along the one main track leading from the Indian frontier town of Raxaul direct to the capital town, Katmandu. Even so, the number of outsiders allowed within the Kingdom prior to the break-up of the Rana oligarchy probably amounted to less than five hundred. Perceval Landon's *Nepal* and Northey's *Land of the Gurkhas* were the only two comprehensive studies of this critical Himalayan border state, and both had had to be based on second and third hand impressions of any area beyond the confines of the small intermontane basin which enclosed the capital Katmandu. Until a decade ago, "forbidden" Tibet was known, frequently visited, and well described in comparison to its southern neighbour. The sole source of located geographical information came from a reconnaissance four mile to the inch topographical survey of Nepal. This, however, was the result of native staff from the Survey of India working rapidly through a country larger than the South Island of New Zealand in the seasons from 1924 to 1927 inclusively. As a result of the prohibition on European entry, the impossibility of field examination, and the unavailability of any other source of information these generalised sheets provoked rather than illuminated the geographer.

From 1947 till 1950, however, the hereditary Prime Minister permitted four select groups of Europeans to penetrate his virtually private estate: following his displacement in 1951 outsiders swarmed in, bringing with them both the benefits and especially the disadvantages that the conservative Ranas had feared. As almost any page of Dr Karan's book shows, Nepal has been making relatively enormous developments towards modernity, but the remoulding of age-old basic subsistence patterns has scarcely begun. A geography of Nepal at this juncture is doubly welcome, therefore. Political, strategic and economic forces now gaining momentum are bound to bring geographical changes with them.

The main aim of the book is, in Dr. Karan's own words, "to describe . . . with the aid of maps and photographs the principal physical and cultural elements of the geography of Nepal, giving special stress to the cartographic representations of resources, economic activity and demographic characteristics". To accomplish this aim we are informed that Dr. Karan photographed most of the country from the air, travelled many miles by jeep, and on foot covered a distance equivalent to twenty ascents of Everest (whatever that means). It is a pity, then, that this lavishily produced volume does not give more precision in map and photograph to the essential elements of the geographic scene. Few of the sixty photographs are large, let alone sharp enough. Their selection is poor, both for area coverage (half of the photographs are taken within the Katmandu Valley) and for individual physical and cultural elements. None appear to be selected from the aerial photographs of Dr Karan, yet these should provide by far the best description of the landscapes of Nepal. Notable gaps which could and should have been filled concern the regional surface relief forms—one has only to look through the photographs accompanying the many mountaineers' accounts listed in the bibliography to realise what is available—and the even greater variety of regional cultural forms. Nepal has long been recognised as a meeting place of a number of diverse ethnic groups. Map 25 outlines their distribution in the broadest terms but the accompanying text and illustrations continue in generalities where one could have expected some specific details. Much the same criticism must be made of the land use and agriculture section. Here Dr Karan presents the only detailed field example quoted in his book—but the example is based on five small villages all in the tiny and agriculturally unrepresentative Katmandu Valley. The absence of detailed information on a kingdom-wide basis is acknowledged by one and all. Because of this, one would anticipate the use of more sample studies to give weight to the work.

The substance and contribution of the book lies in the maps and text on population distribution. Dr Karan has made a notable contribution in defining

for the first time the boundaries of the 491 thums (counties) into which the country is divided, and for which population figures were collected during the first census of 1952-54. As a result the maps of population density and distribution are the most detailed and provocative in the book. To be expected in so mountainous a land is a highly irregular and valley patterned population distribution. But one is surprised to see so clearly displayed the emptiness of the Chura hills, the positive thinning of population as one moves westwards into areas of lighter precipitation. The dominance of Katmandu Valley is, of course, pronounced, but less than expected. In less than one half per cent of the area is concentrated five per cent of the country's population. The maps of religious groups and their distribution are again novel and informative. Such important cultural features as house types and village types are also dealt with in the broadest terms. Industry and power, weakly developed though both are, are lavishly treated with maps, but the essential activities of cottage and subsistence industry are just mentioned. The chapter on transportation and trade adds but little to what is visible from the 1928 survey sheets.

Dr Karan concludes his systematic geography with a traditional division into geographic regions—nine in all. There are, however, no accompanying photographs and only the briefest of verbal descriptions. No one acquainted with the country will quarrel with his major regions of Himalaya, Inner Terai and Terai, but the over-simplification of two-thirds of the country into Eastern Mountains and Western Mountains reveals little of the diversity contained therein.

Much more work needs to be done before the geographical character of Nepal is adequately described. The strategic importance of this Himalayan kingdom grows almost daily, and there is little doubt that much more literature will be available for the next essay at a geography of Nepal. For such a work, however, Dr. Karan has made an admirable reconnaissance.

W. P. PACKARD.

ASSESSMENT AT INDEPENDENCE

Norton Ginsburg and Chester F. Roberts, Jr., *Malaya*, American Ethnological Society, University of Washington Press, Seattle, and Donald Moore, Singapore, 1958, pp. 533 and maps. $6.

This monograph stems from a project undertaken by a team of historians, political scientists and geographers in 1955-56. Their essays have now been revised with the aim of crystallising the Malayan scene at the time of independence. The first five chapters outline Malaya's history, physiography and climate as basis for describing patterns of settlement and transport. Nearly half the book is then used in analysing mass media of communication and the organisation of Malaya's three main races. These chapters reflect the sociological strength of the team, which probes down to such levels as kinship organisation among Malays. No less than ten of the book's twenty-eight maps are found here, presenting among others useful information on the distribution of literacy by communities. The authors then turn to the economic system, drawing heavily on the excellent *Economic Survey of Malaya* written by a World Bank mission to Malaya in 1956. The final sections recapitulate events leading to *Merdeka*.

At first reading the contents have a flavour reminiscent of those handbooks written for British Naval Intelligence in the last war. The work obviously uses a wider range of references than is usual; it covers all essential facets; it is as good an introduction to Malaya as most will need. Yet the picture it presents lacks highlights. To some extent this is the outcome of writers sifting a literature

several stages removed from their subject. In addition, few of the contributors appear to have first-hand knowledge of Malaya, however eminent in their own disciplines. Their insensitivity to local nuances, rather than gross errors of fact or of balance, forms the main weakness of a book which in other respects has much to commend it.

Thus even the careful analysis of Chinese in Malaya omits reference to that locally-born English-educated group known as the "Straits Chinese". The group still provides a major source of recruits for local civil services and professions. Except in Singapore, where actions by the PAP government have aroused their collective awareness, the Straits Chinese seldom act corporately. But their role in Malaya, even as *petite bourgeoisie*, is concealed by treating the Chinese as a homogeneous group regarding Malaya as a career rather than a home.

Similar criticism extends to the demographic section where one looks for an appreciation of Singapore's population problem. In certain rural *mukims* over 4,000 persons to the square mile were recorded in the 1947 census which forms the author's datum. The obvious response, that of developing land resources, has now reached a level where local market gardeners export surplus pigs and poultry from the island. But the enormous rate at which these densities are being augmented, and the fears induced by this Chinese enclave in a Malaysian region, seriously limit scope for manoeuvre. These aspects form a valid and fascinating field for historians, geographers and political scientists, particularly in view of increasing Chinese interest in a region traditionally called China's thirteenth province.

Comment on the role of Malayan health services would have emphasised the realities of a tropical environment. Pioneering by the Institute of Medical Research in Kuala Lumpur and sustained efforts by the Government have now reduced cholera to the status of a medical curiosity, while malaria and typhus have been so firmly suppressed that tuberculosis replaces them as chief killer. The point is that this state is abnormal for South-east Asia. Human achievement in Malaya, rightly regarded as a model for the region, would have slackened if normal conditions of endemic malaria, scrub typhus and hookworm were allowed to prevail. Hodder has recently pointed out in *Man in Malaya* that the incomplete conquest of these diseases in eastern states like Trengganu must be partly responsible for their depressed status. The reduced significance of disease as a factor in the Malayan environment has resulted in a surging rise in population, which in turn creates openings for research by other specialists.

Less significant in this assessment are certain overlaps in topics usually treated sequentially. Readers seeking a picture of Malayan agriculture will find the facts distributed in sections on settlement, Malay organisation and land use; while the otherwise admirable summary of Malayan soils might have been more closely linked with descriptions of land use. In general the text is clear and direct, but minor irritations arise from the persistent use of "Malakka" for the normal Anglicised transliteration "Malacca". The reader might also have been spared such sociological jargon as "unarticulated affiliational antagonisms".

These criticism do not invalidate the objective of "providing a bench mark . . . for understanding a new Malaya". The book is an important contribution, citing over two hundred references. As such it is useful even in Malaya, where sources are widely dispersed or often out of print. Libraries elsewhere will find it essential. That it fails to measure up to the highest quality, and because the picture it presents is monochromatic rather than a fine reproduction in colour, are grounds for hoping that Professor Ginsburg will himself write its replacement.

ROBERT HO.

BROTHERS UNDER THE SKIN

Ethnic and Cultural Pluralism in Inter-Tropical Countries, Report of the 30th Meeting of the International Institute of Differing Civilisations, April 1957, Brussels, 1957, pp. 679, £2.

The proceedings of the 1957 Conference of the International Institute of Differing Civilisations comprise the usual speeches of welcome, an introductory statement on the general theme, twenty-nine papers by individual delegates on conditions in a variety of tropical countries (the term "tropical" is interpreted generously to include Lebanon and the Union of South Africa), reports of discussions by the four conference committees on the legal and political, economic, social and cultural aspects of ethnic and cultural pluralism, and the conclusions adopted on these four topics by the whole conference. Both quantitatively and qualitatively the twenty-nine special reports constitute the major part of the book. The discussions and conclusions are well-intentioned, but scarcely profound, which means that they are rather like the discussions and conclusions of most international conferences.

Such a large number of papers inevitably displays great variations in quality. They are all fairly brief, some of them excessively so ("Cultural Pluralism in India" is "discussed" in a report less than twice as long as this review). One cannot help feeling that fewer papers of greater length would have been much more effective in presenting a general picture of the problems of plural societies. Most of the authors hardly get beyond presenting the bare facts on which an analysis might be based. The most successful are those who seize upon some limited topic for discussion—for example, the paper by Ellen Hellmann on "Culture Contact and Change in the Union of South Africa" is largely devoted to an analysis of the internal contradictions of official policy in regard to the Bantu, with special reference to the recommendations of the Tomlinson Report. Also worthy of special notice is S. N. Eisenstadt's paper on "Ethnic and Cultural Pluralism in Israel", which describes the unsuccessful attempts that were at first made to deny the importance of cultural differences among the immigrant Jews and the nature of the problems which arose from the existence of these differences.

The majority of the reports are straightforward descriptions of the conditions existing in the various countries under review, with the emphasis on the existence of varied ethnic and cultural groups and the relationships between them. One of the main variations is in the position the various reports take up on a scale running from realism to a refusal to admit the existence of problems. At the realistic end one could place the reports on British Central Africa, Sudan and Mexico; at the opposite extreme those on Egypt and Brazil, with the prize going to the report on Algeria, which includes the statement that the present emergency can be disregarded as it is only temporary.

Faced by the mass of facts packed into these pages, one is left wondering what can be made of it all, and not at all surprised that the delegates failed to come to any very profound conclusions with only four days in which to grapple with the material.

As one reads through these papers, even the poorest of them, one is constantly reminded of the complexity of the problems facing plural societies. One of the problems, indeed, is that so many of these societies are not only faced by the problems arising from the diversity of groups in the population, but also other serious difficulties of varying kinds which would be hard enough to overcome even in a unified society. This proliferation of multiple problems is so great that there are difficulties in isolating and comparing the consequences of cultural and ethnic plurality. Nyasaland and Hong Kong may both be plural societies, but

it is hard to think of anything else that they have in common. Even the fact that both have a history of British colonial administration counts for little, so different have been the local manifestations. As Professor Kirkwood reminds us in his paper on British Central Africa, even within this one area two different trends of British colonial policy have been dominant and now add to the difficulties of uniting the three units into one federation.

There are, of course, recurring themes, perhaps the most obvious being the difficulties of devising a constitution, even on a federal basis, which can be relied upon to give reasonable protection to minorities, for one of the sad facts that emerges is that Africans and Asians have in general been no more successful than Europeans in displaying tolerance towards, and developing co-operation with, members of other cultural and ethnic groups.

The really valuable aspects of conferences rarely get into their proceedings and it is probable that this conference was no exception. The delegates may have been stimulated, enlightened and encouraged, but these delights are mostly denied the reader of this volume. As a reference work, a reasonably handy source of information about the problems facing a number of plural societies, it has its uses, but as a basis for a constructive understanding of the forces at work in these varied situations it is largely a disappointment.

J. H. ROBB

THE UNINHABITED CITY

Harold M. Mayer and Clyde F. Kohn (Editors), *Readings in Urban Geography*, University of Chicago Press, Chicago, 1959, pp. 625, $8.50.

It is a characteristic of geographers engaged in particular branches of the subject to complain of a lack of comprehensive texts in their field. Urban geographers are no exception to this rule. In their case, however, the complaints are justified since there are few geographical texts dealing specifically with cities and their characteristics, as well as a comparative neglect of urban geography in introductory general texts. For this reason, among others, the book under review is to be welcomed.

The editors have assembled a wide range of papers by well-known geographers and by scholars from related disciplines, most significantly from the fields of economics, planning, marketing and real estate, and from that part of sociology dealing with those four fields. Some papers suggest valuable concepts or methods of study. Although it would be invidious to attempt to rank the papers in terms of their merit special mention should be made of four: Nelson's "A Service Classification of American Cities" and Hartman and Hook's "Substandard Urban Housing in the United States", provide quantitative measures by which a city may be compared with others in terms of these two characteristics and placed in its regional or national setting. Hartman and Hook, furthermore, have correlated substandardness with a number of other variables for sample cities. Ratcliff in "The Dynamics of Efficiency in the Locational Distribution of Urban Activities" discusses the factors causing internal structure, particularly commercial structure. And Berry and Garrison examine the various theories regarding urban hierarchies in their paper "Alternate Explanations of Urban Rank-Size Relationship." These papers come from four separate fields of urban geography yet they represent but a few of the fields covered in this book.

In this collection of papers there is an emphasis on site, land use, location, economic bases and internal structure, chiefly commercial structure. In contrast, social aspects, that is, the people, and how they live, are almost com-

pletely ignored. Out of fifty-four papers, six only deal with social aspects, and of these one is concerned solely with the effect of daily commuting on the central business district. The editors recognise that the text cannot be completely comprehensive yet this discrepancy is hard to justify. Questions of space can scarcely be relevant since some six papers are devoted to transportation geography, which is of marginal importance in comparison with urban social geography. It might be that the paucity of studies in social geography explains the limited selection. But the editors have created the precedent of incorporating papers by workers in other disciplines so the addition of a few papers, mainly by sociologists, would have filled this very significant gap. The rather slender section on industrial structure is another weakness. And, the addition of a comprehensive bibliography, including both works quoted in the text and other relevant studies, would have been particularly valuable. These criticisms should not imply that the reviewer underrates the importance of studying location and commercial factors but he would emphasise that social and industrial factors also deserve attention.

Many readers will criticise the regional coverage, for there are few references to Asian, African, South American or South Pacific urban areas. Yet the cities of these areas, Asia in particular, have received considerable attention since the late 1930s. The editors in presenting some of the major concepts of urban geography have chosen to concentrate on European and North American cities, a type of city similar to those found in Australasia, and a type with which the majority of readers will be familiar. However, one or two comparative studies drawing upon African or Asian examples would have provided a valuable contrast.

The selection of papers has led to repetition, particularly of some concepts of location. This repetition could have been avoided by careful culling of some of the less valuable papers, or by editing sections which covered concepts already treated in other papers. In some papers the analyses presented do not justify the conclusions reached. A striking example of this is one of the few papers on social aspects, "The Distribution of Puerto Ricans on Manhattan Island". The author gives two causes for the distribution, neither of which is supported by the text.

As is perhaps inevitable in a work of this size and character, the book is markedly uneven in the quality of its papers. Some, as for example the papers quoted earlier, are extremely valuable; others, such as those dealing with urban land use survey and mapping techniques, seem remarkably elementary.

The weaknesses mentioned are, however, more than counterbalanced by some notably valuable sections. For any student interested particularly in the commercial structure of cities, cities as central places, city location theories, and the study of central business districts, this book should be required reading. But the reader must always keep in mind the fact that urban areas are something more than economists's models or laboratories of market research teams.

IAN POOL.

New Contributors

Horace Belshaw, Emeritus Professor of Economics at the Victoria University of Wellington, formerly Professor at the University of Auckland and the University of California, and Director of the Rural Welfare Division of F.A.O., is noted for his studies on the problems of economic development in under-developed societies. He has acted as a consultant and conducted surveys for United Nations organisations, the New Zealand Government and the South Pacific Commission.

S. H. Franklin, Senior Lecturer in Geography at the Victoria University of Wellington, has studied rural settlement in the North Island, New Zealand, as well as aspects of peasant society in Europe. He has published papers in *Economic Geography* on the demographic characteristics of New Zealand communities.

Ooi Jin-bee, Lecturer in Geography at the University of Malaya (Singapore), is well known for his studies on the human geography of the Tropics, with special emphasis on rural development in Malaya. He is author of "Rural Development in Tropical Areas" published in the *Journal of Tropical Geography* in 1959.

Ian Pool, Lecturer in Geography at the Victoria University of Wellington, is working in the fields of urban geography and urban sociology. He is also interested in the human geography of the Southwest Pacific.

Marion Ward is Lecturer in Geography at the University of Auckland. She has studied aspects of the economic geography of Southeast Asia in the course of field work in Malaya for a higher degree at the University of Minnesota.

A. E. Gilmour is a scientific officer at the Oceanographic Institute, Department of Scientific and Industrial Research, Wellington. He has specialised in the study and measurement of tides and currents.

Robert Ho is Professor of Geography at the University of Malaya (Kuala Lumpur. His main interests are geomorphology, more especially soils, and the Tropics. He has been responsible for organising the Singapore Land Use Survey.

W. P. Packard is Senior Lecturer in Geography at the University of Canterbury. He has been a member of an expedition to the Himalayas and has specialised on problems of the High Country of New Zealand.

J. H. Robb is Senior Lecturer in the School of Social Science, the Victoria University of Wellington. He was previously engaged in sociological research at the Tavistock Institute of Human Relations and in social casework in London. He is the author of the book *Working-Class Anti-Semite.*

Bryan Saunders is Lecturer-in-Charge of the Department of Geography, Palmerston North University College, New Zealand. He is a graduate of the University College of North Staffordshire and the University of Adelaide and has specialised in cartography.

J. E. Spencer is Professor of Geography at the University of California (Los Angeles). He has spent ten years in China and worked in the field in many countries of the Orient. He is the author of the standard text *Asia East by South* as well as many works on regional cultures and the evolution of geographical patterns in Asia.

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